Telephone Engineer

WITH WHICH IS CONSOLIDATED THE WESTERN TELEPHONE JOURNAL
ESTABLISHED 1902

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Independent Association and Telephone Engineer Will Co-operate

From the Association News, published by the Independent Telephone Association of America, issue of July 15, 1915:

NOTICE!

This is the last issue of Association News in this form. Hereafter it will be included with TELEPHONE ENGINEER. In the future TELEPHONE ENGINEER will be received by all members of the Association as a part of the Association benefits. We trust all of our readers will be pleased and benefited by this change. You will find announcements, notices and articles pertaining to the Association work in future issues of TELEPHONE ENGINEER.

THE notice in the July 15 issue of the *Association News* which we reproduce here needs little explanation. It means, in the briefest terms, that the Independent Telephone Association of America and TELEPHONE ENGINEER have entered into a co-operative affiliation by which all Association information will hereafter be published in these pages, and all members of the Association will receive TELEPHONE ENGINEER as a part of their membership benefits.

The nature of the arrangement is not commercial. It rests upon mutual appreciation of the importance of the Independent cause and realization of its need for all the aggressive support it can muster. Readers of TELEPHONE ENGINEER know that this spirit of co-operation has prevailed before it took the form of a definite agreement. The editors of TELEPHONE ENGINEER have always held a deep admiration for the work of the Independent Association, and in return have enjoyed the confidence of its officers.

If the Association thinks it desirable that all Independents read TELEPHONE ENGINEER, we on the other hand, consider it absolutely essential to Independent success that the work of the Association be vigorously supported. Such an organization is not merely a social body, nor a mutual admiration society, nor a club for the holding of annual conventions. Properly it is a combination for the solution of common problems; a fusion of a large number of units of small power into a single unit of large power.

In spite of all our ethics and our training in the Golden Rule, the doctrine of might makes right still prevails in business to an extent most of us hesitate to admit. In any field of commercial activity *the little fellow is safe only so long as he remains unimportant.* Once he grows beyond mediocrity, or is placed by fate in a strategic position, he must prepare his defences against forms of attack that outmaneuver the European war machines.

There is peace in poverty. While no one covets your possessions no one will molest you. And there is peace in supremacy, if your position is so high and your power so great that none can assail it. But no one wants the security of insignificance. Industriously we develop our opportunities and increase our riches; and sooner or later someone more powerful wants them. If we are unprepared, we lose; for neither man nor organization of small strength can cope with the trained and subtle methods of the predatory exponent of might.

The Independent Telephone Association of America is the standing army of the Independent cause. If you call yourself an Independent and do not take your part in the government that maintains it, if you do not meet the taxes that support it, then you are unprepared. If you rely upon your own individual efforts to meet, unaided, the full force of possible attack, you are trifling with a false sense of security.

The nations of the world sign treaties of alliance. Organization is the first law; for the security of numbers and the power of combination are more obvious than the sum of two plus two. He only stands aloof who sees no need of strength or foolishly considers what he has sufficient.

We believe every Independent telephone man should be a member of the Independent Telephone Association of America. If we did not so believe, we would not have entered into the arrangement we are announcing and it will be our constant purpose to materialize that belief.

The Western Electric Picnic Disaster

EVERY newspaper in the land has published the awful story of the Eastland steamship disaster, when the big excursion boat, loaded with employes of the Western Electric Company and their families, capsized in the Chicago river and drowned more than half of its human cargo of 2,500 souls. If there be anyone in the country so secluded that the news has not reached him, let him be spared the details.

Saturday, July 24, the big Hawthorne plant closed down for the employes' annual picnic. Monday, the

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If Your News Dealer Will Not Supply You—Please Notify Us

26th, it remained closed; the foremen and timekeepers were busy checking up the missing. Those who want the figures will find them, as accurate as could be obtained on the morning of the 29th, on another page.

In an extraordinary emergency, extraordinary means of relief were adopted; and, as usual, the telephone was the great go-between in all the frantic appeals for haste. It called the police, the firemen, the pulmotors to revive the living and the motor trucks to haul the dead to the hastily improvised morgues. One telephone instrument, mounted on the hull of the overturned ship, served to direct the work of rescue; hundreds of others, rush installations on the wharf, on the nearby bridge, in the newspaper offices and the morgues, took care of the agonized cries of the public for information. The loop exchanges of the Chicago Telephone Company, caught suddenly with an overwhelming multitude of calls, until all the lamps on the big switchboards flashed at once, responded with hardly a break in service. That is the way the big public utility meets its emergencies.

In a time of black despair for hundreds of families bereft of their sole support, with hundreds of little homes still unpaid for, the benefit fund of the big employer shone like a star of hope in the valley of death. To a fund hastily collected for the sufferers, such as Chicago always responds to generously, the Western Electric Company alone contributed a hundred thousand dollars. There is relief in the knowledge that the survivors at least will be cared for if they cannot be comforted.

What we call civilization knows all too many of these wholly preventable catastrophes. We need not increase the horror of the occasion by listing others nearly as bad. The moral is that in each case some one has blundered—or worse. Yet the records of the courts show no punishment meted out to any culprit. The Western Electric Company is a powerful organization. We hope and trust it will make its employes' case its own, and see that the state neglects no evidence that will make a terrible example of that responsible being whose greed or carelessness made possible the greatest catastrophe of peace.

Investigating the Operators of the Big Companies

ONE of those governmental inquisitorial bodies with which we are becoming so familiar, the Commission on Industrial Relations, is looking into the conditions of employment of telephone girls in eight large cities in the United States. Frank P. Walsh is chairman of the commission, which has been meeting in Chicago the last month.

So far the recommendations made public are merely those of an individual investigator, Nelle B. Curry, and have not been passed upon by the commission or its chairman; so there need be no immediate excitement over its findings.

This report urges that the operators be allowed a higher wage, payable on a flat weekly or monthly basis, and a six-hour working day. Much is made of the "nervous strain attending telephone operating combined with rigid discipline of exceptional severity." The youth of some of the operators is also criticized, and an eighteen-year minimum age limit recommended.

Most investigations of this nature are quasi-altruistic in purpose, and considerate employers often wish it were possible to meet some of their recommendations, and thus bring the millenium a little nearer. Purely as a socialistic dream, it would be nice to give everybody higher wages and shorter hours and easier work. One manufacturer of a popular brand of vehicle has actually put part of such a system into effect; and today in the big Ford plant in Detroit a minimum wage of approximately five dollars a day prevails. The scheme is entirely successful, too.

But public utilities are not Ford plants—nor can they be Fordized. Private concerns which sell their product at large profits can pay their employes whatever they please, so long as the buying public pays the price. Wages of public utility employes, on the other hand, are practically beyond the control of the employer. Expenses are watched jealously by state commissions and municipal committees whose interest is not with the employe's wages but with the public's rates.

And higher wages mean higher rates for every public utility. Shorter hours or less calls per operator mean a bigger payroll—and higher rates to the public.

Thousands of working girls are getting lower wages than do telephone operators, although the unregulated profits of their employers could easily absorb a bigger payroll. Regulation of department store employes is a far more promising field; for there is noth-

ing standing in the way of improvement but the objections of spoiled stockholders and the traditions and customs of our commercial economy.

If the public itself is in favor of higher wages for telephone operators, or its concomitant of shorter hours, the decision rests in its own hands. The telephone company can spend for expenses only what it receives in revenue from the public. It seems not to be generally understood, even by official investigators, that a public utility under regulation is not a money-maker; it is merely a money-changer. Its revenue is is so adjusted that it can only pay its help their stipulated wage, take care of maintenance, and pay the ordinary and necessary interest on the money invested. There is nothing left to divide among the employes in the form of higher wage or more assistance. If employes cost nothing, the company would have no more money, for rates would be lowered. If employes are to cost more, then rates must be higher. The public, in short, is the actual employer; the company merely the superintendent of employes.

So long as we have the manual switchboard we will have these investigations and recommendations. Socially just though they may be, they are embarrassing to employers who are powerless to improve conditions, however strong is their sympathy with the idea.

And to just the extent that they annoy the manual representative, they please the automatic man and make good publicity for him.

Down in Tennessee There is Another Case

CLARKSVILLE, Tennessee, is a city of some ten thousand population on the Cumberland river in the center of Montgomery county. It is eight miles from the Kentucky line, forty-five miles from Nashville, and a hundred and fifty miles from Louisville, Ky. It is the southern extremity of the toll line system owned by the Central Home Telephone Company of Louisville, and expects soon to have Independent connection with all Tennessee via Nashville.

Now it is reported that the Bell Company has bought the Clarksville Home Telephone Company—or at least has gone as far as it could in the transaction, and is now awaiting *the approval of the United States attorney-general.*

In 1911 the Bell company had an opportunity to buy the Clarksville company, but apparently did not consider it worth buying. The improvement in its stock comes from the Nashville franchise, for which the Automatic Telephone Company of Nashville applied some time ago.

Like Sanford, Florida, whose case we took up last month, Clarksville seemed destined to become an important link in the Louisville-Nashville Independent toll chain. And the Bell company, as usual, took steps to remove the link.

In these two cases—and others which we are sure will be brought to light by the publicity already given—we look to the United States Department of Justice for a decision that will tell us definitely whether or not the commercial warfare used to restrain telephone competition is wholly lawful. We want to know if it has the seal of government approval as being perfectly proper for use wherever the principles of monopoly meet interference.

We can see no complications or legal quibbles in any of these cases. They are all as plain as pike-staffs. But the Department of Justice will not take the initiative in ferreting out breaches of law. Some one must be the complainant. That is one of the things an Independent Association is for.

BEGINNING *with this number, Telephone Engineer will be promptly discontinued on the date of expiration of each subscription.*

The Thinker as Wealth Maker

(Copyright, 1915, by Dr. Frank Crane)

It is a favorite theorem among debaters on economic questions that all wealth is produced from the three sources—land, labor, and capital.

But there is a fourth element overlooked. The greatest of all wealth producers is *mind.*

It might be classed under labor, but it is not exactly labor; it is not work; it is the power to see, to invent, to co-ordinate. A man can sit on his shoulder blades and smoke a cigar, and, if his think-works operate sufficiently, add more wealth to the country than ten thousand hand-workers.

It is not the amount of land a man has, it is the amount of gumption that determines his productivity.

I once asked an Illinois farmer how much land a man needed in order to make a good living. He answered: "If he's got brains enough all he needs is land enough to stand on."

President Vail's report to the Telephone Company for 1914, just received, is illustrative. Here is a business that has climbed from zero in 1876 to over a billion in 1914. The whole thing germinated in an idea. It is not capital, it is not land, it is the vision of an inventor that is the cause of this amazing business structure.

What the nation needs is not more things, it is more brains.

Intelligence is creative. Ignorance is destructive.

The simple reason why Europe is now devastating and destroying is ignorance. They do not understand the art of government. They haven't sense enough to devise the necessary machinery with which international disputes may be settled by law. They haven't even sense enough to try.

But these are only phases of the great truth that man's spirit (mind) creates wealth, even as God created the world, for man is the son of God.

All wealth springs from thought-seed. It was the steam thought in the mind of Watt that grew into the enormous railway, steamship, and factory wealth of today.

Both laborer and capitalist are apt to get a little too chesty at times.

The thinker is worth the two of them.

Telephone Engineer Editorial Crystallizes Association Action on Physical Connection

¶ The editorial "Force Physical Connection" in the July issue of TELEPHONE ENGINEER was one of the best, one of the most cogent, able and useful discussions of the telephone situation and possibilities ever presented. It was clean-cut, logical and forceful in every sentence. It carried complete conviction to every thoughtful reader—left no room for doubt, either as to its premises or conclusions. And the right way to reach results, and the desirableness of those results, and their effect upon telephone service and its usefulness to the public were presented in a truly masterly way.

¶ "Compulsory physical connection is the most important consideration before the Independent telephone operators today."

¶ The telephone world, as a whole, and the general public have not been given an inside view of "protracted and exhaustive discussion between the Attorney-General and our company," which President Vail of the A. T. & T. Co. mentioned following the making public of the notable letter of December 19, 1913, which has given rise to so much more and more protracted discussion since.

¶ But it is evident that physical connection in telephone service was one of the chief elements of that discussion, for that letter promised some degree, at least, of such connection—the average man does not offer what has not been asked or suggested. Since that letter months have elapsed until years begin to loom as possibilities in discussions, in propositions, in counter proposals, in a variety of suggestions, with but negligible practical results thus far, and very little, if any, more in prospect. And meanwhile, as has been stated heretofore, what seemed to be sure promises in that same letter seem to have fallen into "innocuous desuetude."

¶ This leaves room for doubt of rapid progress in securing the "most important consideration" before the telephone world, along present lines, and emphasizes the advice of TELEPHONE ENGINEER—admirable advice—accompanied by clear indications of how to use it. That is to say: If you want something, and it's right to have it, go after it, and get it.

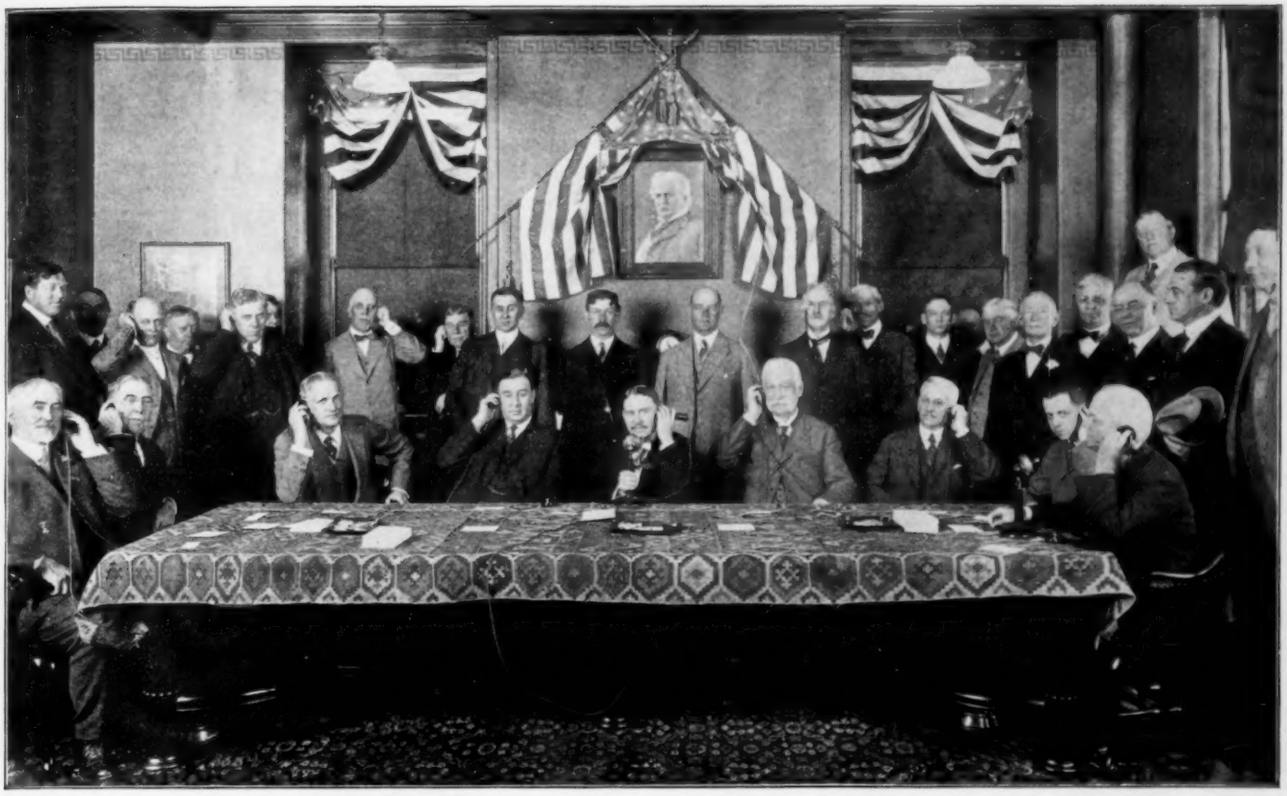
¶ At this point it should be stated that an effort has begun—it followed closely the July issue of TELEPHONE ENGINEER. It had been mooted and debated before, and earnestly urged by some of the leading Independents of the country, who had doubts of practical progress in the efforts just mentioned, but until now definite, concerted action had not been decided upon.

¶ Decided? That depends upon the "sincerity, earnestness and energy of the Independents." They have the ability, financial and otherwise, and the question has been, and is still further to be, squarely presented to them. If they still respond as they can, and should, as TELEPHONE ENGINEER so ably suggests, the fight is on, and excellent legal opinion and advice encourage far more than a hope of the success predicted by TELEPHONE ENGINEER.

¶ Many favorable responses have already been given to the invitation to assist in this effort, and more are coming from day to day—many more should and will come, so that it shall be a "strong pull all together." The concrete plan has been fairly entered upon—shall it not be tested to a conclusion—to what seems an inevitable conclusion under the amendment to the Interstate Commerce law, of June 18, 1910, which made telephone and telegraph companies, generally speaking, common carriers, controlled by that Commission?

¶ TELEPHONE ENGINEER and the Independent Telephone Association of America will give further information to any who may wish it, to any who desire the consummation so clearly suggested in "Force Physical Connection."

E. B. FISHER,
President, I. T. A. of A.



Mayor Thompson and Chicago Business Men Talking to San Francisco. Seated at Table, Left to Right—Alonzo Burt, Vice-President and Treasurer of the Chicago Telephone Company; John A. Spoor; H. F. Hill, Vice-President of the Chicago Telephone Company; Mayor William Hale Thompson; B. E. Sunny, President of the Chicago Telephone Company; James B. Forgan, President of the First National Bank; John G. Shedd, President of Marshall Field & Company; Solomon Smith, President of the Northern Trust Company; A. S. Hibbard, American Telephone & Telegraph Company.—Courtesy Bell Telephone News.

Lowering Conduit in East Chicago.. A Ticklish Job Performed Successfully Without Interrupting Telephone Service.—Courtesy Bell Telephone News.

Overturned Hull of the Eastland, the Western Electric Picnic Boat.—Copyright International News Service.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.

American Association of Engineers Forms in Chicago

For the purpose of raising the standard of ethics of the engineering profession and of promoting the economic and social welfare of engineers, the American Association of Engineers has been organized with headquarters at 29 S. LaSalle street, Chicago.

The new organization will make possible development in a field heretofore untouched by engineering societies, namely, a binding together of the entire engineering profession, particularly in the promotion of commercial phases of engineering.

The principal objects which the association wishes to accomplish are as follows: (1st) Affording means for the interchange of information; (2nd) Maintaining a service clearing house; (3rd) Affording patent and legal advice; (4th) Supervision of legislation; (5th) Proper publicity.

All degreed engineers, technical educators, chemists, draughtsmen, having at least two years of practical experience, and all practical engineers with at least five years' experience in the field, are eligible for membership. Membership dues are $10 per annum.

The association has adopted very interesting constitution and by-laws. Officers and directors have been elected as follows: W. D. Wilcox, president; T. B. Lambert, vice-president; J. C. Kelsey, treasurer; Arthur Kneisel, secretary; Garrison Babcock and A. H. Krom, directors.

This association represents a new channel in engineering co-operation along the lines suggested by Prof. F. H. Newell, formerly director of the United States reclamation service, in his interesting paper published in the *Engineering Record*, June 19.

The association will without a doubt enjoy a rapid growth and include all prominent engineers in practically every branch of the engineering profession.

Telephone Pioneers Announce Coast Trip

The committee of arrangements of the Telephone Pioneers of America has decided upon the following itinerary for the trip to the Exposition at San Francisco:

Special Telephone Pioneers Limited will leave New York, Boston and Philadelphia, Tuesday, September 14; Chicago, September 15 after the arrival of the party from the East.

September 16—Omaha, stopping for a short period.

September 17—Denver, stopping four hours, giving opportunity for a ride around the city.

September 17—Colorado Springs.

September 18—Leave Colorado Springs—D. & R. G. Railway (scenic ride by daylight through Royal Gorge).

September 19—Salt Lake City, stopping for ride around the city and visits to points of interest.

September 20—Arrival at San Francisco, where headquarters will be established for one week, with accommodations at the St. Francis, or other leading hotels, at which special rates have been provided.

September 26—Trip along the shores of the Pacific, via Del Monte, Santa Barbara, to Los Angeles, where two days will be spent, giving opportunity for visits to the beaches, and to Pasadena and the surrounding country.

September 29-30—Trip to San Diego, where one full day will be given to visiting the San Diego Fair.

October 1—Train to Los Angeles. At this point it will be optional with the members of the party to return by direct route to Salt Lake and Chicago or return on Pioneers Special via Santa Fe route to the Grand Canyon, spending one day, and return to Chicago and the East via Kansas City.

The trip will occupy 23 days from New York and Eastern points.

Following are estimated fares from points shown below to San Francisco and return. These fares include round trip railroad and Pullman transportation for the entire trip; all meals en route in dining cars (no meals at Chicago, Kansas City, Colorado Springs and Salt Lake); side trip to Grand Canyon of Arizona; excess fare between New York and Chicago; hotel accommodations (lodging only) at first class hotels in San Francisco and Los Angeles; and transfer to and from station at stop over points.

From Albany, $213.75; Boston, $224.25; Buffalo, $201.05; Chicago, $166.05; New York, $227.38; Philadelphia, $227.38. One person in lower berth.

The minimum number required to charter a special train is 125. The minimum number for a special car is 20. Members of the party who gather at specific points to take part in the trip will be accommodated on special cars, and no doubt on the through special train from Chicago to the Pacific coast and return.

The Telephone Pioneers invite their friends and their associates in the employ of the Bell system to join with them in this excursion to the Pacific coast, believing that a rare opportunity will be afforded for an enjoyable trip.

Seattle Telephone Course

At a meeting of the Seattle Telephone Society, University of Washington, Professor Magnusson of the university faculty addressed the society and threw open to its members the engineering school and laboratory, explaining apparatus and many of the delicate appliances used in electrical work. Of particular interest was the arrangement shown for common battery "A" and "B" boards, mounted in such a manner that the various functions of each part were readily observed, and so arranged that every detail of the operation of a call from origin to termination could be followed.

A most important consideration of the meeting was the submission of a proposal from Doctor Magnusson and Professor Johnson as to whether or not a sufficient number of employes might be interested to warrant the establishing of a special night course in telephony.

Over 150 male employes were in attendance, and it was decided that the matter would be canvassed with all of the employes of the Pacific Telephone and Telegraph Company and Western Electric Company, and that a petition would then be presented to the university faculty, who would then make arrangements for the special course mentioned.

The postmaster-general of Australia contemplates combining at busy street corners a pillar box, telephone cabinet, and stamp-selling machine. A new style of telephone box will be tried. Ventilation and privacy will be combined.

The street railway in a German city provides all its cars with telephones, enabling their crews to communicate with headquarters by connecting the instruments with wires that run beside the tracks.

Thousand Drown in Western Electric Picnic

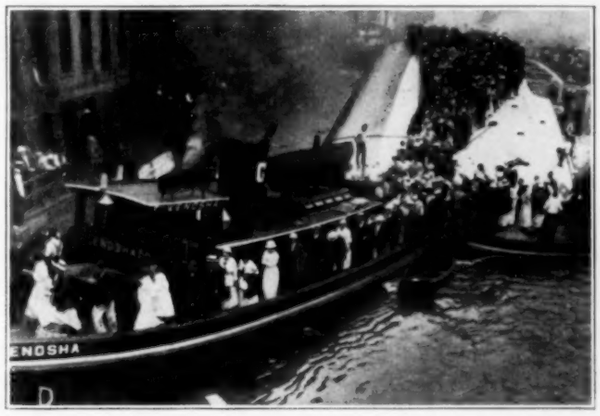
Excursion Steamer "Eastland," Filled With Employes, Capsizes

SATURDAY, July 24, will long be remembered as the day of Chicago's greatest disaster—the fatal listing of the excursion boat Eastland—which turned turtle at its dock in the Chicago river, causing a loss of 1,354 lives, men, women and children, as nearly as could be ascertained by noon, July 29.

The Eastland was a pleasure boat, chartered by employes of the Western Electric Company for their annual lake excursion and picnic at Michigan City, Ind.

According to experts, the accident occurred because of improper ballast and a passenger list far exceeding the steamer's rated capacity.

As the Eastland was being headed midstream the masses of passengers moved to the starboard rail, the immediate weight of which, unprotected by sufficient ballast to retain the boat's balance, caused it to tip over in the river. Hundreds were thrown from the upper decks. Many were pinned beneath its hull and those in the lower cabins and staterooms had no opportunity to escape whatever.



The Work of Rescuing Survivors of the Eastland Disaster. Many Were Taken Off by the Tug Kenosha, Which Formed a Bridge From the Side of the Boat to the Dock.

Ten minutes after the disaster the news was flashed to every part of the city and its suburbs. Immediately thousands turned to their telephones to obtain further details relative to the safety of their kin and friends. The telephone load reached its maximum almost instantaneously and within a half hour every emergency and relief bureau, police department, newspaper office and information bureau was constantly being called upon by frenzied men and women in search of details. The number of calls reached a higher climax than during the recent street car strike in Chicago. The situation, however, was far different in that each call was made with no particular purpose other than a general inquiry, in many cases unanswerable. As expressed by an official of the Chicago Telephone Company, "it was like pouring a pail of water into a bean blower."

Every possible effort was made by Chicago business men and especially the Chicago Telephone and Western Electric Companies to relieve the situation by distributing authentic reports and details to relatives and friends of the drowned and rescued, as well as the general public. The willingness and readiness of the officials of the companies to meet the emergency with all possible speed was evidenced by the fact that a little over two hours after the steamer capsized special telephone service had been installed directly upon the side of the overturned boat. Extra telephones were placed in service in special relief bureaus at the wharfs and special shifts of operators, working a few hours at a time, took care of all incoming calls for news of the catastrophe. A temporary card indexing department with three extra telephones was established for the purpose of momentarily checking up and correcting the lists of dead and survivors as they were flashed from the river or the various morgues and hospitals. Besides this service the telephone company transformed its commercial department into an information bureau, where 100 clerks received and tabulated all information. Twenty special wires ran into this bureau, and all patrons calling for news of the tragedy were given all information gratis whether calling from pay or free telephones. Even toll calls to the nearby suburbs relating to the disaster were carried free. The Chicago Telephone Company, indeed, deserves congratulations on its splendid co-operation in this hour of great need.

Besides the splendid emergency service furnished by the telephone companies, business men along the river offered every possible means of assistance. Steamship companies, large wholesalers and warehousemen turned over their buildings to house the dead and rescued. Private telephone trunks were extended to the use of the public, gratis. Large department stores furnished hundreds of large vehicles to deliver the injured to nearby hospitals, and the dead to loop morgues. In no instance was co-operation lacking on the part of Chicago's public.

The Western Electric Company maintained a private telephone connection and a telegraph wire from its New York office directly to the scene of the wreck. Every possible emergency was met by the company in order to make relief possible. A fund of $100,000 has been contributed by the company for relief purposes. This amount is further increased by a $5,000 subscription from the Chicago Telephone Company.

A thorough check made at the Western Electric Company's plant disclosed a total of 749 known dead and missing.

A special bureau of relief will be conducted by the company for the purpose of assisting those who depended upon the lost employes. Although the company has long maintained an emergency and pension fund, officials state that directors of the company have elected to appropriate a special fund, which with the various other funds being secured by relief societies, newspapers and popular subscriptions will be sufficient to meet every emergency.

The establishment of telegraph service in Inner Mongolia, China, has been under consideration of the Peking government for some time past; and it has now been decided upon. From reports furnished by the governor of Fengtien, it is estimated that the total expenditure of the scheme would amount to $1,000,000. It is reported that Liang Tun Yen, minister of communications, has decided that the work of construction shall commence soon.

The Inside of the Chicago Situation

What the Promoters and the Politicians Have Done to the Chicago Independent Company—Concluded

BY ARTHUR KNEISEL

THE count and investigation undertaken by the Telephone Bureau of Chicago's Department of Public Service was very thorough. Several days were devoted to conferences to decide the best methods of procedure. The names listed in the most recent issue of the telephone directory of the Illinois Telephone and Telegraph Company were clipped from books and pasted on form sheets on which were printed a list of questions to be answered by the subscribers. The answers to these questions were to show the relation of the user to the company, to determine whether he could be considered a bona fide subscriber. Investigators were then employed and assigned to districts to question the subscribers and record their replies. Each investigator who was employed to interview the telephone patrons was sworn before he began his work and signed and swore to the authenticity of the inspection he made. The inspectors met with some opposition on the part of telephone users who refused to sign any statement, but after repeated efforts, the desired information was secured in practically every instance. The telephone company did not show a sincere spirit of co-operation in this work and some time was spent by the bureau in investigating complaints that employes of the city were making statements derogatory to the automatic telephone interests. The complaints were all found to be without a tenable foundation. After the method of conducting the count was well established, the attorneys for the telephone interests appeared before the council committee and admitted that they were not giving telephone service to 20,000 subscribers. The count was, however, carried to completion in order that the information gained thereby might be available throughout the further discussions in settling the question.

The count showed that there were 19,276 telephones connected to the automatic system, 6,393 of which could hardly be considered bona fide subscribers under any interpretation of the term. Judging from the financial statistics of the Illinois Tunnel Company, it is highly improbable that there ever were 20,000 bona fide subscribers paying the rates permitted by franchise, connected and operating with the automatic system.

The report of the count and investigation suggested material for a plan according to which the retention of the automatic telephone system as such might be guaranteed without loss to the bondholders of the property. It proposed that the automatic system and the manual system operated by the Chicago Telephone Company should be connected through an interconnecting office. According to such an arrangement, a subscriber having either an automatic or a manual telephone could get connection with any telephone on either system. The report showed, and supported by affidavits, that the same interconnection as suggested has been and is in successful operation at the offices of the L. & N. Railroad at Louisville, Ky. To minimize any contention that connecting with independent telephones would cause the service of the Bell Company to deteriorate, the report showed and supported by affidavits that telephones not manufactured by the Western Electric Company were connected with the Bell system at Aurora, Ill., and that they did not harm its service sufficiently for it to object to the interconnection until informed thereof through the report of the Telephone Bureau. The report further showed that the proposed plan of giving (automatic) flat rate service in a limited district and connecting to a system outside of that district on a measured service basis is not new but is very similar to the "neighborhood" service now rendered by the Chicago Telephone Company. The report supplied estimates which tend to show that interconnection of this kind would be highly remunerative to both the Chicago Telephone Company and to the interconnecting company, without being unfair to the telephone subscriber or the automatic company.

One of the most surprising developments of the situation is the apathy amounting almost to antagonism displayed by the manufacturers of apparatus to any effort to perpetuate the automatic system in Chicago. Judging from the testimony of the officials of the companies interested in the installation of this system in Chicago, one would think that there is absolutely no way of earning financial returns on an automatic system—at least not in Chicago. Either these men were not entirely sincere in their testimony or the statements of the advertisers of automatic apparatus are over-sanguine. That the automatic system has thus far been a failure in Chicago is not questioned. But I have grave doubts that the attempts made to establish the telephone property were any more sincere than the fear of a possible forfeiture of the franchise compelled them to be. The whole result might have been different if there had been no tunnel system to form the paramount object of activity.

At the meetings of the National Independent Telephone Association and the Independent Telephone Association of America, the following resolutions were offered for consideration:

Whereas, It has been called to the attention of the directors of the Independent Telephone Association of America that there has been undertaken in the city of Chicago, an effort whereby the Independent telephone plant shall be absorbed by the Bell telephone interests; and

Whereas, It is the sense of this association that any efforts intended to destroy the Independent plant, as such, are against the best interests of the citizens of Chicago and the Independent telephone industry at large; now, therefore,

Be it resolved, That this association hereby again request the present and elected administrations to use their vested powers and good offices to the end that the destruction of the Independent plant may be prevented, and that its lines shall be available for interconnection with the other Independent plants outside of Chicago; be it further

Resolved, That a copy of this resolution be forwarded by our secretary to his Honor, Carter H. Harrison, mayor of Chicago, and the Honorable William Hale Thompson, mayor-elect.

The Independent Telephone Association of America indorsed this resolution on April 17, 1915.

In the National Independent Association, objections were raised to it by a representative of a company which manufactures and sells automatic telephone systems.

Several days prior to the submitting of the city corporation counsel's now famous opinion that "serving 20,000 bona fide subscribers" might be interpreted to mean "readiness to serve 20,000 subscribers" an official

(NOTE—The first mention of 20,000 bona fide subscribers in the July issue, page 13, should read 2,000.)

of the Illinois Telephone & Telegraph Company made the same statement to a representative of the Telephone Bureau using practically the same expression. This opinion was rendered just prior to the retirement of Mr. Sexton. The next corporation counsel announced his withdrawal from the law firm with which he had been connected on October 15. This law firm represented the automatic telephone interests prior to that time and has been active in their behalf since then. In their endeavor to get further advice on questions of law and policy, Mayor Thompson appointed Walter L. Fisher as special counsel to study the question and to work with the Committee on Gas, Oil and Electricity. This committee also engaged Judge Stephen A. Foster as its advisor. Judge Foster, in a lengthy opinion submitted July 1, disagreed with the city corporation counsel's office on the possible interpretation of the term "serving 20,000 bona fide subscribers" and brought in damaging evidence against that interpretation. He showed that the receivers and their attorneys and Mr. Harris of the Automatic Electric Company all recognized the validity of the forfeiture clause of the ordinances in their appeal to the court for permission to issue receiver's certificates for the purpose of securing 20,000 bona fide subscribers. During the discussion of his opinion, Judge Foster pointed out that the city corporation counsel's office, in complying with an order from the city council to draft ordinances to bring about the forfeiture of the automatic telephone system, merely included the system built under the grant of February 20, 1899, and failed to mention the ordinances amendatory thereof. Such an omission might prove a serious handicap, Judge Foster pointed out, in event an actual forfeiture were attempted, for there is but little left of the plant built under the ordinance of 1899.

Judge Foster stated in conclusion:

In my opinion the city of Chicago has the right under the ordinances granted the Illinois Telephone & Telegraph Company to pass an ordinance declaring a forfeiture of the rights of that company granted under the ordinance of February 20, 1899, and of the plant and equipment for telephone purposes constructed by said company on its successors and assigns under said ordinance or any of the later ordinances amendatory thereof. Such ordinance would at least amount to a declaration of the purpose of the city to declare a forfeiture. Whether or not subsequent court action would be necessary on the part of the city in order to secure possession of the physical property so declared forfeited to the city is a question upon which I am not at present called upon to pass and which will require further consideration. In any event, the first step in the proceeding, if this committee and the council see fit to enforce the rights of the city in this regard, is to pass such ordinance and then to follow the same up, if need be, by court proceedings.

Judge Foster also stated in an addendum:

The question arises for consideration whether or not the Chicago Tunnel Company did not, by making the above mentioned contracts with the American Telephone and Telegraph Company, the purpose of which is made clear by the proposed ordinance submitted to the city council, violate the terms of the forfeiture clause above set forth in the original ordinance of February 20, 1899. I am of the opinion that the Chicago Tunnel Company entered into an agreement with an existing telephone company doing business in the city of Chicago, which agreement tended to make competition inoperative. I have every reason to believe that the American Telephone and Telegraph Company itself was doing business in the city of Chicago on the date of its agreement with the Chicago Tunnel Company—that is the 8th day of July 1913—and in reality, as appears from a consideration of the contracts and the proposed ordinance taken together, the real purchaser of the Chicago Tunnel Company's property was to be the Chicago Telephone Company, which last named company, of course, was doing business in the city of Chicago at that time. That this agreement "would tend to make competition inoperative" is self-evident. As soon as the Chicago Tunnel Company secured a contract for the sale by it of its property to the ChicagoTelephone Company the "tendency of such contract would be to diminish any desire on the part of the Chicago Tunnel Company to push its efforts to compete successfully with the Chicago Telephone Company. It is not necessary to find that all competition ceased. It is enough, under the terms of the 1899 ordinance, to find that there was a "tendency" to make competition inoperative.

It would, therefore, seem to me that the case presented to this committee is not one of a going concern seeking to carry out all of the terms and conditions of the ordinance and to comply with the obligations thereby imposed but rather a case of a company which has in effect abandoned all effort to comply with the terms of the ordinances, has admitted the failure of its telephone undertaking and has definitely abandoned the purpose for which its original ordinance was granted—that is, the securing of telephone competition in the city of Chicago.

In view of these considerations and the emphasis that is placed by some upon the alleged fact that the telephone system of the Tunnel Company is a going concern it seems to me desirable to incorporate in the ordinance to be submitted to your committee appropriate paragraphs concerning the failure of the Tunnel Company to comply with the terms of the ordinance of February 20, 1899, and concerning its practical abandonment in the particulars above named, of all effort to comply with that and the other amendatory ordinances relating to its telephone business. The draft of an ordinance submitted herewith will be found to contain such provisions.

Walter A. Fisher, who was retained primarily by Mayor Thompson, submitted a long opinion drawn particularly to five questions propounded to him by the council committee. Mr. Fisher did not agree with Judge Foster in all the details of the latter's opinions. Mr. Fisher is of the opinion that the action of the court in the matter of forfeiture would depend to a great extent upon what the city of Chicago intended to do with the automatic telephone system; whether it intended to forfeit and scrap the system or whether it intended to forfeit for the purpose of insuring the future operation of the system, should, in Mr. Fisher's opinion, be given careful consideration before any action is taken.

In his opinion, Mr. Fisher says:

* * * If you wish my individual opinion, I still hold the view which I have many times expressed, that it is always in the long run a net loss to any city to deal otherwise than fairly with its public utility corporations. So long as the city does not own and operate its own public utilities, it is in the public interest that private investments in public utility corporations shall be sufficiently remunerative and sufficiently secure to command the money necessary for the best service and that this class of service shall be required upon the basis of an adequate and secure return to those who furnish it.

The company claims that its telephone property is not being operated, and that it cannot be operated without any actual excess of operating expense over total receipts (allowing nothing for interest, renewals or depreciation), and that the automatic telephone cannot successfully compete with the manual system under the conditions existing in Chicago, and that any dual telephone service under these conditions is against public interest. It asks the city to consent to a sale of its telephone property to the Chicago Telephone Company.

The predecessors of this company did or tried to do many things which, in my judgment, were against the public interest. I have taken an active part in preventing some of the things they tried to do. It probably would have been given the right to sell in 1909 if it had not been opposed on the ground that the continuation and development of its service was in the public interest. Punishment for its past performance or lack of performance was waived and it was given an extension of time within which to demonstrate its good faith and to comply with its ordinances. Its present owners and security holders insist that they have demonstrated good faith, and that they have complied with the ordinances to the fullest extent possible.

Are the claims of the company correct? If the property is forfeited, does the city propose to operate it, or to sell it to the Chicago Telephone Company, or to remove it and sell the materials. In declaring a forfeiture is it the purpose of the city to secure and continue a public service in any manner or to any extent to which the company is failing or refusing to render the same public service?

I do not mean to suggest that the city can now decide many of the details of any plan for carrying out such a purpose, but that it can and should decide whether there is such a purpose which is feasible and in the public interest and which could be adopted by the city. Can the automatic telephone system, including the necessary space in the tunnels, be operated either by the city or by any license of the city except at an operating loss? Is it in the public interest that it should be so operated? Should it be operated as a separate system or with interconnections with the system of the Chicago Telephone Company? Can it be so operated upon terms which would not involve a financial loss to the city directly or to the people of the city if the operating loss should be shifted to the Chicago Telephone Company and by that company to its subscribers? Is the only practical use to which the city could put the property a sale to the Chicago Telephone Company or a sale of the materials to some one else? Is it merely for the sake of the money for which it could be sold that the property is to be forfeited? If this is the purpose, may it not be to the financial interest of the city to secure a money compensation from the company for consenting to the sale to the American Telephone & Telegraph Company, provided only the actual value of the physical property and tunnel space is added to the capital account of the Chicago Telephone Company or the American Telephone & Telegraph Company (for the purpose of determining the reasonableness of future rate regulation)?

If the price fixed in the ending contract between the Tunnel Company and the A. T. & T. Co. is in part passed upon the removal of competition, would the city secure anything like that price if it forfeited the automatic telephone franchise and property, and destroyed or reduced the menace of competition by reason of the legal or financial obstacles to such competition in the hands of the city?

If financial gain is the object of the city, has it really considered the available alternatives? Should not the city at least determine whether it is forfeiting this property for financial gain or the continuation of a public service? Is not this determination essential to any wise decision as to the policy of forfeiture?

In the first annual report of the Department of Public Service of the City of Chicago (pp. 108-142) suggestions are made of various plans for continuing the operation of the automatic telephone system. In my opinion these plans should be carefully considered, with a view of determining whether any of them are feasible from the legal, financial and operating points of view, and whether any of them are desirable from a public point of view. Such a consideration ought to make it possible for the city to determine—not in detail, but as a matter of general policy—whether there is anything which can and should be done with this telephone system which the company is unable or unwilling to do, and which the city or its licensee or grantee would be able and willing to do. I have already pointed out that a decision of this question may have a controlling influence upon the decision of the courts in the event of a forfeiture.

After the council committee had discussed these opinions, it took up the discussion of interconnection between the automatic and manual systems. This discussion was primarily the result of the reading of a paper before the committee by the writer. Although there seemed to be a decided effort on the part of some of the members of the committee to put the whole matter on file, other members of the committee had become interested in interconnection, as a result of which it was decided to retain telephone experts to investigate this feature of the question. On July 26 the committee voted to engage Kempster B. Miller of McMeen & Miller to report on the matter. This report is expected to be complete by September 1.

The Committee on Gas, Oil and Electric Light deserves much credit for the patience and courtesy with which it has listened to and considered the discussions of the various parties interested in the matter. Recently it invited Messrs. Charles G. Dawes and David Forgan, who were receivers of the property for a time; C. O. Frisbie, who was president of the company; C. W. Hotchkiss, who is now president of the Chicago Utilities Company, and B. C. Groh, who was engineer during the construction of the last portion of the plant. B. E. Sunny, president of the Chicago Telephone Company, was also invited to appear before the committee and was questioned relative to the disposal his company intended to make of the property in case a sale was permitted. Mr. Sunny stated that his company expected to add the purchase price to its capital account. If this is permitted and the scrapping of the system is permitted, telephone users of Chicago must necessarily pay dividends on capital for which no physical equivalent exists. Mr. Sunny stated that he could not tell what disposal would be made of the property until after they had possession of it for at least six months.

The committee also heard discussions by representatives of sixteen or more civic and political organizations whose opinions all tend toward the advisability of enforcing a forfeiture clause of an ordinance in some one instance (and they consider this a clear case) to prevent the inclusion of such clauses when there is no honest intention on the part of the utility company to abide by them. Morton L. Johnson, a telephone engineer of long experience, spoke on the technical phases of the question and spoke of the feasibility of cheaper telephone service. Mr. Johnson brought out an interesting point relative to using the off-peak traffic load. He suggested the use of the Telechronometer to measure the duration of conversations, the controlling apparatus of the meters to be run at varying speeds during different parts of the day. During the peak load, a subscriber would get, say, a one-minute conversation for a certain rate, and later, when the load was not so heavy, he might get two minutes' conversation for the same price; during the night he might get five times as much for the same price.

Mr. Johnson did not attempt to give all the details of the plan, but the suggestion looks attractive. The council committee adjourned on July 20 for the summer. It will meet shortly after September 1 to consider Mr. Miller's report. It has been suggested that N. C. Kingsbury, vice-president of the A. T. & T. Co., be invited to appear before the committee in the fall.

Whatever action the committee will eventually take is a matter of conjecture, but it cannot be accused of not having given the question consideration or that it refused to listen to anyone who wished to appear before it.

Dubuque to Force Franchise or Pole Rental

The decision handed down in Keokuk, Ia., in favor of the Bell Telephone Company will have no effect on Dubuque, according to the opinion of city officials.

The situation at Keokuk and at Des Moines is practically the same as the Dubuque situation. The three cities have been trying to force the telephone company to either procure a franchise or to pay a pole and wire rental annually.

In Keokuk an ordinance was passed prohibiting a telephone company to operate in the city unless it procured a franchise. The case was brought into the courts, with the result that it was decided in favor of the telephone company, basing a decision on legislation enacted in the early seventies which gave telephone companies the same thing as a perpetual free franchise in the entire state.

Officials have been attempting for years to force the telephone company to procure a franchise. The company has refused to procure a franchise. Acting on this refusal the officials drafted an ordinance providing for a wire and pole rental, the revenue from which it is said will total about $5,000 a year.

ASSOCIATION NEWS

by THE INDEPENDENT TELEPHONE ASSOCIATION OF AMERICA for
1504 Association Building, CHICAGO, ILL.

BY W. S. VIVIAN

WALTER E. McCORNACK, formerly an attorney for the Interstate Commerce Commission, now practicing law in Chicago, Ill., has been appointed general counsel for the Independent Telephone Association of America. The Association, having so many legal questions involving the operation of public utilities, found it necessary to have a legal advisor who was experienced in public utility questions.

Mr. McCornack was an attorney with the Interstate Commerce Commission from 1907 until 1910, when he resigned and began to specialize in matters relating to transportation and public utilities coming before the Interstate Commerce Commission and the public utilities commissions of the various states. He is a graduate of Dartmouth College, class of 1897, and of the Northwestern University Law School in the class of 1899, having been admitted to the Bar of Illinois in 1900. He is also a member of the Dartmouth College Alumni Council.

From 1900 to 1907 he was engaged in private practice in Chicago, and at the latter date he was appointed to his position with the Interstate Commerce Commission. Mr. McCornack was associated with Mr. Darrow in the Haywood - Moyer - Pettibone trial at Boise, Idaho, and he is the author of a book entitled "Insurance Law of Illinois."

Mr. McCornack also once had a national reputation as a football authority, having been captain of both the football and baseball teams while at Dartmouth College, and he coached his alma mater in the fall of 1901 and 1902 and started Dartmouth up the ladder in the football world. He is known as the father of modern football at Dartmouth. He also coached Northwestern University, Illinois, in football.

Walter E. McCornack, Former Interstate Commerce Commission Attorney, Now General Counsel for the Independent Telephone Association of America.

INDIVIDUAL REPRESENTATION AT WASHINGTON AND OTHER BENEFITS.

The large number of member companies of the Independent Telephone Association of America who have availed themselves of the opportunity offered by the Association to secure the services of Attorney Edward E. Clement as Washington agent, has been very gratifying. What one of the largest companies thinks of the arrangement is clearly stated in the following letter:

INDEPENDENT TELEPHONE ASSOCIATION OF AMERICA: We are enclosing designation of agent form appointing Edward E. Clement as our agent in Washington to receive notices from the Interstate Commerce Commission, as we think it best for all telephone companies to have the same representative. —FEDERAL TELEPHONE & TELEGRAPH CO., Hugh Taylor, Assistant Treasurer.

We quite agree with the conclusion of Mr. Taylor. Every Independent telephone company which comes within the provisions of the Interstate Commerce Act (and every company that sends or receives an interstate message is under the Act), could, for obvious reasons and with advantage to all, have the same representative.

This benefit which gives member companies individual representation and service at Washington without any additional cost, for which the regular minimum professional charge is $10.00 a year, is but one of many benefits which the Association has provided for its members.

The benefits which have come to member companies thus far and which will come in the future cannot be estimated. Let us enumerate just a few:

Simultaneously with the birth of the Independent Telephone Association of America, the Independent telephone business took on new life and activity throughout the field, which has in no way diminished; as witness the service work carried on by the Western Pennsylvania Independent Telephone Association, where a service engineer, W. H. Hay, is giving his entire time to the work and is securing excellent results; the Eastern Pennsylvania Independent Telephone Association, where they have a Service Committee holding conferences tending greatly to improve and facilitate the service throughout that section, in charge of C. J. Larsen, engineer of the Consolidated Telephone Company of Hazelton, Pa.

Chief operators have been employed to improve service in several states, more particularly Miss D. A. Wahl, who travels throughout the territory of the Federal Telephone and Telegraph Company of New York; Miss K. M. Gang, who is employed by the Illinois Independent Telephone Association, with headquarters at Bloomington, Illinois, and Miss T. Anne Barnes, who is employed by the Iowa Independent Telephone Association, with headquarters at Des Moines, Iowa.

Operators' schools of instruction have been and are being held in Illinois, Wisconsin, Iowa, Minnesota, Indiana, Michigan, Ohio, Kentucky, Pennsylvania and New York.

There have been distributed thousands of copies of Standard Operating Instructions covering long distance and magneto and common battery work in the local field. Notice the large amount of new work that has been completed, is now under way or is contemplated in the states of New York, Pennsylvania, Ohio, Indiana and Minnesota and the recent long distance developments in the South.

Then there is the Service Department, to which many companies have come for information on Central Office Construction, Maintenance and Appraisal; Traffic covering Local, Long Distance, Scheduling of Operators, and Rules; Collections, Accounting, Rates, Advertising, Employment, Commissions on Long Distance; numerous inquiries on legal matters, such as Contracts, Commis-

sion Decisions, High Tension Lines, Franchises, Liability, Incorporation, By-Laws, Insurance, Stock Transfers, Taxes, Bonds, Loans, Right of Way, etc.

All member companies have this privilege.

The Standardization Committee, W. H. Hay, chairman, with the co-operation and support of the manufacturers, is carrying on a series of conferences and tests that will, we believe, prove to be of inestimable value in securing greater efficiency in transmission and operation.

The Accounting Committee, E. M. Frisk, chairman, is at work in the interest of our companies and the business and is co-operating with the Interstate Commerce Committee.

The Advisory Committee, consisting of W. H. Bryant, Mobile, Ala., chairman; G. W. Robinson, St. Paul, Minn.; H. Linton Reber, St. Louis, Mo.; B. G. Hubbell, Buffalo, N. Y.; E. B. Fisher, Grand Rapids, Mich., is considering plans to proceed with the "toll connections" and "merger" matters, which will be disclosed at the proper time. All of these are benefits which come to member companies and the business as a result of maintaining the Independent Telephone Association of America.

Notwithstanding the fact that the Association now enjoys a membership of several hundred companies, it earnestly solicits every Independent telephone company throughout the United States to send in application and $5.00 membership fee so that they, too, may participate in the benefits of the Association. A larger manifestation of the spirit of "co-operation" on the part of all will mean greater efficiency, greater earnings, greater safety, greater permanency, a stronger Association and a better business. Why not help?

Telegraphs and Telephones in China

There is some uncertainty as to the immediate future of telephonic and telegraphic development in China, especially concerning telephone in and between cities, which is a matter of finance. The country's telegraph system is owned by the Chinese government and has been operated with considerable success for several years, both in domestic operation and in connection with cable and other foreign lines. Immediately after the revolution an expansion policy was determined upon by the government telegraph administration, comprising a supplementary telephone service to be owned and operated by the government and telephone extensions in various Chinese cities. The telegraph administration borrowed $2,500,000 gold from the Eastern Extension & Great Northern Telegraph Company (the cable company with which it is most intimately connected in foreign business), to extend its telegraph lines and establishing certain telephone lines. Interest and payments are to be met out of current earnings of the administration in its foreign business.

Considerable of the official program has had regard for the manufacture of telegraph and telephone, as well as electric light and power, materials in China. Representatives of the government have been sent abroad to study foreign establishments manufacturing such materials, and in the official program it has been planned that new depots for the manufacture of such goods shall be established during the current year, while in 1915 the work is to be extended to include all materials used in wireless telegraphy. However, there are indications that financial considerations will interfere materially with this program for the present.

The use of the telephone in China is much more limited than the telegraph, though the Chinese take to the telephone with extraordinary readiness. Modern interurban communication by telephone is almost unknown in China, the only exception being the line between Peking and Tientsin and several small lines used in connection with the dispatch of railway trains. Local telephone exchange systems are found only in Peking, Tientsin, Shanghai and Canton. They are government owned and are operated as a part of the telegraph system. The number of subscribers is not available, but the exchanges are small.

As a part of its policy of extension, the Chinese government is increasing the use of the telephone as an adjunct to the main telegraph system, the telephone being used to forward telegraph messages from the ends of telegraph lines to interior points not yet reached by telegraph. In the past two years considerable extensions have been made to the systems in Chekiang and Kiangsu provinces in extending the local service from Shanghai, and in Hupeh, Yunnan, Shensi, Hunan, and Shantung provinces. The program for the current year provides for extensions of the systems in Szechwan, Yunnan, Kweichow, and Kwangsi provinces, and in the next two years it is planned to extend these small telephone systems into Kweichow, Yunnan, Szechwan, and Kansu provinces and to include Tibet and the New Dominion in them if possible. Much of this program, however, at present is uncertain in view of the political condition of the country and of the political considerations some of the proposed extensions will involve. Considerable actual improvement has been made in many parts of the country, including points near Hongkong, however, and there is no doubt but that the general work will be undertaken as soon as financial and other considerations make it possible.

It is uncertain exactly what course development of telephone systems in the cities of China will take—that is, whether they will come by private initiative and investment or solely through government operation and control. At present, the government seems disposed to control such services directly and to own and operate them so far as may be possible. While the Chinese take to the telephones readily and gladly, it is difficult to obtain enough subscribers in a Chinese city to support a system, and it is a long struggle to make a system pay financially without government support or without connection with some other enterprise like the telegraph system. Nevertheless, the extension of the use of telphones in all parts of China will doubtless be great, and in some cases rapid, as soon as more settled conditions obtain.

Pennsylvania Demands Interchange Service

A proposition to compel competing telephone companies to make connections with rival lines and accept messages over the same is contained in a bill recently introduced in the Senate. The enactment of this legislation would give every subscriber of a Bell or a Keystone or other independent company an opportunity to call a subscriber upon a line other than that on which he has a direct connection.

The bill authorizes the Public Service Commission to require the physical connection of tolls lines, so that messages may be uninterruptedly sent over the lines of two or more companies and to compel any telephone company to receive and transmit messages from the toll lines of another company. The commission would regulate the charges for such messages and the proportion each company would receive.

Increasing Transmission Efficiency

A Review of the Work Accomplished by the Eastern Independent Traffic Association

BY C. J. LARSEN

C. J. Larsen is engineer for the Consolidated Telephone Company, Hazelton, Penn. He is chairman of the Service Committee of the Eastern Pennsylvania Independent Telephone Association and a member of the Standardization Committee of the Independent Telephone Association of America. Mr. Larsen, along with A. J. Seymour, engineer for the Tri-State Telephone & Telegraph Company, St. Paul, Minn., was selected by the Standardization Committee to make the tests at Purdue University on July 22 and 23. He was formerly engineer for the American Electric Telephone Company, Chicago.

IN the early days of the art it was customary to base the principle comparison, covering the merits of transmission, on the outcome of a test of telephone equipment only; in other words, when the question of improved transmission was up for discussion, a number of different telephone sets would be tested out against each other and the set that proved superior in either quantity or quality, or both, was adopted.

The objection to this method was that in no case was any definite standard used for comparison and, of course, as a final result, there was a wide difference of opinion among the operating men as to which manufacturing company's instrument proved the best.

While the telephone test was carried out extensively, the component factor of comparative efficiency, from a transmission standpoint in central office equipment, lay dormant. For instance, comparisons of percentage of mile loss in repeating coils, cord circuits, bridge drops, relays and ringers, and last, but not least, the question of proper direct current supply regulation in cord circuits, was left largely to regulate itself.

Present day practice has changed the former method. We now have a fixed standard known as a "Conference Standard" comprising 32 miles of standard No. 19 B. & S. gauge cable, having a loop resistance of eighty-eight ohms per mile and a capacity of .054 microfarads per mile between conductors, associated with a standard subscribers' set repeating coil and 24-volt battery at each terminal.

Having established a standard of transmission, all of the factors entering into the building up of a complete transmission connection can be compared and their equivalents determined. The following few cases, based on this principle of comparison showing high frequency losses to voice currents (not taking into consideration losses in current supply) will explain the above statement:

Transmission Equivalent in Miles of Standard Conference Cable	
Average wire-wound heat coil	0.5
Early type repeating coil	5.
Subsequent improved repeating coil	2.
Present day repeating coil	0.5
Tinsel cords, per pair	.03
Steel cords, per pair	.25
1000 Ohm bridge drop	.15
500 Ohm bridge drop	.975
200 Ohm bridge drop	2.
2 M. F. Condenser	.16
No. 12 B. & S. Gauge copper wire	.122
No. 10 B. & S. Gauge copper	.085
No. 22 B. & S. Gauge lead covered cable	1.6
No. 17 B. & S. Gauge copper clad	1.7

In dealing with the transmission phase of telephone practice, especially with reference to long distance problems, it must be borne in mind that the losses referred to in this article enter into a completed connection and, consequently, it is of utmost importance that they be as low as possible.

Very extensive tests have proven that transmitted speech cannot be carried out commercially over more than 32 miles of standard cable; this statement, of course, refers to our unit measure and not to commercial cable transmission; which, by the application of suitable loading coils, spaced correctly, can be carried out over much greater length. With this in mind, our lines and equipment should be designed and built in such a manner that the zone radius of any two subscribers talking long distance, will never manifest a loss greater than thirty-two miles of standard conference cable.

In order to accomplish this, careful study will have to be made of the long haul messages; even after our central office equipment has been brought up to a maximum efficiency certain circuit combinations that would fall within the limits for a 50-mile toll connection will not do at all for a 100-mile connection, probably on account of the gauge of copper or the bridge coil losses, or for other reasons. The writer strongly urges the use of phantom circuits for building up long connections.

Three cautions may be introduced here:

First, in order successfully to operate a phantom circuit, it must be well insulated from trees, ground or elements tending to lower the insulation.

Second, proper transposition must be cut in or cross talk and inductive disturbances will result.

Third, high efficiency coils must be used and the fact must be borne in mind that the transmission will be as much poorer on the side circuit, after the installation of the phantom coils, as the loss of the coils manifest; in other words, if a modern half-mile coil is used the transmission loss in terms would be as follows, before and after:

No. 10 B. & S. copper transmission equals .085; line under discussion, 350 miles long.

350 X .085 equals 29.75 before phantom installation.

2 X ½ plus 29.75 equals 30.75, after phantom installation.

Attention is also directed to the circuits used in toll boards. In some cases the writer has observed that the direct current supply to a subscriber's loop was less on a connection set up through the toll board than when connected through the local board; this change in current supply being brought about by circuit application necessary to attain supervision and other features incident to

service trunk operation. That such a method is decidedly wrong must be evident.

A recent test made by the writer, varying the current supply in the subscriber's loop from 68 to 150 milliamperes, resulted in a gain of fifty per cent in transmission; the test being conducted over 150 miles of toll lines.

Special attention is called to the method of feeding battery in private branch exchanges. I have observed in a number of cases that a call which required central office switching, received its battery supply from the "A" board operator's cord circuit, while the battery for a local connection was taken from a small set of storage cells located at the p.b.x.

A study of this condition will disclose the following: On an established toll call to a private branch exchange subscriber, central office trunking will, of course, be a necessity, and if the exchange trunks are of average length, invariably, the transmitter of the subscriber talking long distance, connected up in this manner, will receive less current than when he is talking to a local subscriber connected up within his own private branch exchange zone.

Where this condition exists, a remarkable gain can be made by the rearrangement of the trunk circuits so as to take the battery in all cases direct from the p.b.x. source of supply.

A word of caution is also directed to the use of steel cords in toll boards, although I think it is generally agreed upon that for toll line transmission, the steel cord has no application whatever.

The use of condensers of low capacity on cord circuits, to obtain a non-ring-through feature, and where these condensers enter into the talking circuit, is also to be discouraged; likewise there is no necessity for a double clearing-out drop with condensers interposed between them on through toll cord circuits, although the writer knows that the above is considered a standard circuit by some operating companies.

The controlling element to this entire problem of transmission is to eliminate any series resistance or impedance as well as any loss due to the application of bridged resistances, consequently it follows that the closer we adhere to this golden rule, the better will be our transmission.

When comparing the value of bridged coils, whether they be drops bridged across in-and-out jacks or clearing-out signals, the effective resistance to voice currents, and not the ohmic resistance, is to be considered. It is possible for a 1,000 ohm drop to manifest a greater loss to voice current than a 250-ohm drop, the difference being due to the structural condition of the two drops, however; the construction remaining the same, the higher the resistance, the higher the impedance, and, of course, the less the loss.

A few words on the subject of repeating coils will not be amiss. No matter how efficient this particular unit is, its presence is bound to cause, as is explained in this article, some loss and when the fact is considered that it is quite likely for a toll connection to be set up of a number of interlinking lines, probably going through a half dozen or more offices, it is evident that if each office switched this line through on a pair of repeating coil cords, the sum total in loss incident to the repeating coils only would be considerable.

This means that careful judgment on the part of the operators and a thorough knowledge of the proper application of when to use repeating coils and when not to, must be exercised. It is, of course, evident that where an operator has learned that two toll circuits are quiet, but upon connecting them together, a noisy connection results, the presence of a repeating coil will have a tendency of reducing the disturbing element and rendering a quiet circuit. In this case, as in the case of where a toll call originates or terminates in a common battery exchange, the repeating coil has a proper application.

Through the combined efforts of the members of the Service Committee of the Independent Telephone Association of America, we are endeavoring to improve long distance transmission over our lines.

A large amount of work has been done. The high resistance heat coils have been removed from our toll line equipment, modern high efficiency repeating coils have replaced the early type and where through toll connections are set up, the loss incident to bridge impedance has been reduced considerably.

Inspection of toll lines by members of the committee has been made and where conditions required attention, the company was notified, and in this connection I wish to say that prompt action usually followed the suggestions made by the committee.

While the improvements attained, I believe, show themselves, this work is just begun; it will be necessary to carefully grade all of the toll lines, give them a numerical prefix and determine the transmission constant of all of these circuits so as to enable our toll operators to know what circuits are to be used to connect to given points and still be within the permissible transmission limits.

This will call for a lot of field work, but when the information is obtained, and our toll business routed in a scientific manner from a standpoint of efficiency, rather than with a view of hauling a message over as much of the originating companies' territory, regardless of consequences, we will have made a start in a direction that will be bound to bring results and increased revenue.

It will be of interest to note that the western part of the state, under the capable direction of Mr. Hay, service engineer, is working along the same direction as the eastern part; also that the Standardization Committee of the Independent Telephone Association of America, of which the writer is a member, together with the manufacturers, are at the present moment at work on what will mark an epoch in Independent telephone practice, namely, the standardization of equipment, values of current supply and other factors which are now a handicap to Independent telephone service.

Cumberland Valley Company Reorganized

The protective bondholders' committee of the Cumberland Valley Telephone Company, Harrisburg, Pa., consisting of James Brady, chairman; John E. Fox, Henry W. Tracey, Charles A. Kunkel and William J. Lescure, announce that they have completed the work of the company's reorganization, and application is about to be made to the court for a decree of foreclosure of the first mortgage of the company, amounting to $1,500,000.

It is expected that the decree of foreclosure will call for a public sale of the property and franchises sometime during the month of October. It is intimated that the committee will purchase the property and franchises and the company will then reorganize and be able to proceed with its increasing business as a solvent company.

Operating Schools and Their Benefits

Papers Prepared by Operators After Attending Meetings

Operators Meet at Henry, Illinois

AN operator's school at Henry, Illinois, June 22 and 23, conducted by Secretary Vivian of the Independent Telephone Association of America in the interests of the Cheadle and Sterrett properties in that vicinity, developed a great deal of enthusiasm among the attendance. As a result of the meeting, and to stimulate interest in its purposes, cash prizes were offered by the company for the best papers prepared by attending operators on the subjects discussed during the meeting. The first and second prize-winning papers are reproduced here:

Qualifications of an Operator

By Frances A. Ferrero, Chief Operator Ladd Exchange, Bureau County Independent Telephone Company.

Notes of the meeting—Tuesday Afternoon Session.—Short talks by Mr. Cheadle, Mr. Sterrett and W. S. Vivian as follows:

Qualifications for a good operator: Pleasantness, reliability, effectiveness, accommodation, good voice, stick-to-it-iveness, interest, articulation, courtesy, cleanliness, neatness punctuality, thoughtfulness, honesty, promptness, truthfulness, reliability, patience, cheerfulness, confidence, loyalty, education, good hearing, tact, self-control and courage.

Talks on: Using correct phrases. Correct handling of keys. Speak plainly, listen carefully and avoid repetitions. Consider every call a rush call. Do not use Hello.

Wednesday Afternoon Session.—Short talk by Mr. Sterrett. Talk by Mr. Vivian on following subjects as each came up in the actual performance of giving, recording, switching and receiving long distance and toll calls. Interest in other exchanges, not your own only. Co-operate with other operators. Keep after long distance calls until completed, thereby reducing the number of "lost calls." Be courteous to all. "Courtesy begets courtesy." Properly test lines before ringing on them. Special attention was given in exemplifying unusual, collect and messenger calls. Get enough information about a toll call when call is first taken from patron. Transmitter close to lips. Plain and legible handwriting.

Wednesday Afternoon Session.—Talk on "Your Own Worth," by Mr. Cheadle. Toll work demonstration supervised by Mr. Vivian, followed by talks on following: Uniformity in using phrases. Use collect, not reversed. Do not argue about rights on a toll line—wastes too much time; give in. Give long distance work preference over local work. Long haul calls must be taken care of first. Memorize official long distance code and use it. If a line is reported busy do not call operator when line is vacant, unless requested to do so. If she does, report soon as possible—not later than 15 minutes. Hold operators conferences often, also with neighboring exchanges. Keep your temper under any circumstance. Team work and co-operation. Do not tell a lie, no reason to do so. Be honest above all. Work for the position ahead. Watch and learn. Use good grammar. Pronounce each word in full, do not use short cuts. Set a good example both in and out of office.

WHEN I reached home Wednesday evening after attending the sessions of the Operators' School of Instruction at Henry, Ill., the first thought that came into my mind was this: I have been sent by my company to this school with considerable trouble and expense on their part, now it is plain duty on my part to put into practice all the helpful methods and instructions that were spoken of and also to instruct other operators in my charge to do likewise to the best of my ability. And how am I going to bring about the desired results?

One of the suggestions was that nearby exchanges should hold regular meetings of operators and managers. Acting upon this, I talked the matter over with the local manager, which resulted in asking the operators of a neighboring exchange to meet with us at an early date to talk over the different subjects Mr. Vivian so ably handled and how to apply them to our own offices and operators.

As I took my place the next morning, I firmly decided to live up to the best of my ability to the rules, methods and phrases, again acting upon Mr. Vivian's suggestion, that if a chief operator expects obedience, good service or almost any other quality desirable in a good operator, she must first of all set a good example herself.

Next came the first on the local phrase list, "Num-

Frances A. Ferrero, Winner of First Prize.

Group of Operators Attending the School of Operators Conducted by W. S. Vivian at Henry, Ill., for the Cheadle and Sterrett Companies.

ber, please." I am sorry to say that a pleasant (?) "Number" was all our operators used, so bravely I started out with "Number *please*." Did I get any good results? Most assuredly. Several of our subscribers who (seemingly) did not have the word "please" in their vocabulary, quickly responded, and I can safely say that every eight people out of ten used the word "please" in their answer, which goes to prove that "Courtesy begets courtesy" is right.

Patience is another virtue which we were taught is a great asset to an operator. Who among us has not at times felt that conditions were almost unbearable, people cross and impatient and the temptation to express our feelings almost impossible to resist? We probably did control our temper, but in a rather uncomfortable state of mind. Which of us, after listening to Mr. Vivian's talk on the subject, did not feel that we would make a greater effort to be patient and to keep our temper in proper control? I can safely say that if our mind will, for a moment, travel back to the talk on this subject, we can and will succeed.

So on throughout the list, talks on handling calls, using correct phrases, honesty, team work, etc., all showed good results if properly applied and are so helpful that an operator can not realize how much she can be benefited by attending a school of instruction unless she has actually done so.

Of course operators in large exchanges are benefited by attending a school of this kind; but more so the operator in a small exchange, as she has not had the training and experience in the different branches of the work, and to have it explained in an agreeably instructive manner cannot be otherwise than of very great help. Any operator who does not leave with the firm resolve that the time was well spent, with the feeling that she is going to do better work, be more courteous to her subscribers and associates, more loyal to her company, such an operator has missed her calling and a telephone operating room is the wrong place for her. I would advise every operator to attend as many sessions of these meetings as possible. Then come back to your office and put your learning into actual practice in your office and your company will not only send one, but as many operators as can be spared to the next meeting held. It will not only help you in the work you are now doing, although that is where we must first put our good resolutions into practice, but in the home, in society and whatever position you may hold in the world in later years. The qualities which have been impressed upon you as the requisites for a good telephone operator, you will find have fitted you to properly fullfil your duties, whatever they may be, to the satisfaction of your associates and yourself also.

Taken all together, these schools of instruction cannot help but urge and stimulate an operator to greater efforts to supply prompt and satisfactory service to all concerned, which, after all, is our chief aim in our chosen work, that of being efficient telephone operators.

[Miss Frances A. Ferrero began nine years ago as night operator, at fifteen years of age, with the Spring Valley Telephone Company, which had an exchange at Ladd at that time. This company was later absorbed by the Bureau County Independent Telephone Company, with which she has been working for six years as day operator, with a year of extra and night work, and as chief operator for two and a half years. The Ladd exchange has a two position magneto board, employing six operators including extra and chief operators, local manager and trouble man. The chief operator is also regular day operator, tests lines and trouble and assists in collections.]

Katherine O'Brien, Chief Operator, Jacksonville, Ill.

Mrs. Bessie Lewis, Chief Operator, Union Telephone Co., Owosso, Mich.

Isabelle Felise Elling, Ohio State Telephone Company, Toledo, Ohio.

Some Comments on Operating

By Regina Carlson, Princeton, Ill.

SINCE attending three of the sessions of the school of instructions for operators held at Henry, Ill., we have been fully convinced of the importance of efficient operating as explained by W. S. Vivian as the only key to success.

We firmly believe that if the standard rules and methods were put into practice by all independent companies their patrons would take notice of the changed conditions. Independent telephony would be given a boost, as the efficient operator would thus have a chance to show that the "principal cog" of the machine is doing effective work. We believe, too, in

the wisdom of holding schools for promulgating these rules and practices.

It is our duty as operators to give our company our very best service. In order to give good service we should be prompt, accommodating, patient, honest, cheerful, truthful and pleasant at all times.

By answering a call in a pleasant voice, "Number, please?" the subscriber knows immediately the disposition of the operator.

To a party calling long distance, the operator should say, "I will connect you with long distance." Long distance answers, "This is long distance," permitting him to give the call in his own way, asking only the information necessary to complete the call, and then acknowledging the ticket by saying, "We will call you in just a moment; will you be there?"

Testing a circuit is very important. First, always listen, wait at least three seconds, and if the circuit is not busy, say, "Are you waiting? Are you through?" to be said slowly and distinctly.

Passing a ticket, say "This is (name of station) a ticket." After the ticket has been verified, the receiving operator reports to the originating operator by saying, "Please hold the line." Having reached the party called for, she says, "Long distance is calling Mr. ———," and complete the call at once. If the call cannot be completed at the time, the originating operator notifies her party and says, "I will call you in just a moment." He will then know you are using every effort to complete his call.

Pay Station Calls—Notify the party calling the rate for three minutes and suggest to him, "Please have exact change ready." If there is over-time on the call, notify him when he is through by saying, "Please deposit ——— cents for ——— minutes overtime."

Appointment Calls—Special care should be taken to get the time correct; it is also well to notify the party five minutes before the appointed time to be sure he has not forgotten his appointment.

The tone of voice is very important, particularly on toll service. Toll operators should cultivate not only a distinct articulation, but low tones and a pleasing voice.

Courtesy is extremely important to the growth and development of telephone service.

Every operator should memorize the codes, as 50 to 75 per cent of time used in passing a call is unnecessary. Handling cords and plugs properly is very important. Always grasp the shell of the plug and never push the plug by pressing on the cord.

We should always be striving for something beyond our reach; strive for the impossible things. It is not what we do, but how we do it, that counts, and constantly looking after others. In other words, cooperate and furnish service that will satisfy the patron and also produce dividends for the company.

Within the short time that has elapsed since the Henry meeting much favorable comment has been made by patrons of our service, showing that the seven operators representing the Bureau County Independent Telephone Company received not only a pleasant outing, but also grasped and are now putting into practice many of the points emphasized by the instructor, Mr. Vivian.

Our compliments are due Messrs. Sterrett and Cheadle, whose efforts have made it possible for so many operators to attend these important meetings.

The Good That Operators Do

By Katherine O'Brien, Chief Operator, Illinois Telephone Company, Jacksonville, Ill.

WE are accomplishing some good results in our office by trying to be kind and more courteous to our patrons and are receiving better treatment from them. We are receiving no complaints from patrons in regard to discourtesy or irritable operators.

No persuasion or argument will have the effect on an angry person as a sweet gentle voice. What greater gift could we have than when we use this voice to calm an angry person? Is it not a pleasure to have that same angry voice responding to you in sweet, gentle tones? Do you not feel happy when your day's work is over that you not only did your work well, but really did some good?

Our patrons want full value for what they pay and it is our duty to repay them; give to them your very best and you will soon have them co-operating with you; they appreciate your attention, willingness and interest.

Remember your loyalty to your employers, be a valuable asset to them, they need your help, they depend upon you for their success, which is also your success.

Make your work a success, do not let it become merchanical to you; no success will come to you if you are satisfied in only doing just that for which you are getting paid. There is always something more which could be done, so let us not only do the things today and tomorrow, but always.

A Soft Answer

By Edna McClintock, Lima, Ohio.

MY telephone career began in June, 1904, at which time I entered the employ of the Wapakoneta, Ohio, telephone company as a local operator. During that summer my hours were relief hours the greater part of the time and were much too short for me generally, for I became fascinated with the work from the beginning. After two years of local work, I was placed on the long distance board. This seemed to be my vocation, for I took to the work at once and progressed in proportion to my liking of the work. For six years I filled this position, at the expiration of which I resigned, embarking on another career.

In September, 1913, I became associated with the Ohio State Telephone Company at Lima, Ohio, at that time the United States Telephone Company. Following the resignation of the evening chief operator, I was promoted to that position, filling it at present.

I think long distance work one of the most interesting and, at the same time, most trying professions of the day. We must not forget to cultivate our voices and also our dispositions as, in my estimation, these are the two most important factors necessary to become a sucessful long distance operator.

When you come in contact with an operator who is a little cranky and is trying to impress upon you that a certain circuit is her sole possession, and that you have no right thereon, do not argue with her but experiment on her with this little proverb, "A soft answer turneth away wrath." If your experiment proves successful, as it is bound to, adopt it as your standard. There is only one way to be a good long distance operator, and that is to curb your temper. I realize better than some of you, perhaps, how hard

this is to do at times, as I am well supplied with what we commonly call "spunk." But it pays the company and, in the end, it benefits you even more.

By Central Home, Kentucky, Operators

HANDLING SERVICE COMPLAINTS.
BY DORIS DUNCAN, CHIEF OPERATOR.

TELEPHONE companies realize more every day that the success of their business depends largely upon the manner in which their employes meet the public, or attend to its wants. Tact and courtesy are necessary, not only for solicitors, collectors, managers and cashiers, but also toll operators, local operators, information and trouble clerks, wire chiefs and especially trouble men and installers. The troubleman can often satisfy a subscriber by giving a reasonable explanation of the trouble and could, if necessary, explain in detail the cause of the trouble which will in nearly every case be accepted by such subscriber.

Naturally the operators are in a position to do more along this line than any other employes. The most important factor in the successful operation of an exchange is the service given over the switchboard. The importance of constant courtesy on the part of employes and of a willingness to go more than half way toward acknowledging discourtesies and in avowing the absence of intentional rudeness can not be exaggerated in the relations between the representative of any telephone company and subscriber.

The difficulties of maintaining first-class telephone service are rarely appreciated by the public who naturally can not realize the complications of traffic. Unfamiliarity with operating conditions on the part of a complaining subscriber often makes the restoration of normal service harder since the tendency of the fault-finder is to demand little less than perfection and to give the company too little credit for its efforts. In dealing with such subscribers, invite them to see for themselves the inside workings of the central office if they can be persuaded to make a visit to the operating room. It also is essential to fully inform complainants of the character of the service investigation, resulting from their appeals or what is done on the part of the company to correct a fault.

The best rule for us all to go by is to extend the same courtesy that we would expect. The Golden Rule, I believe, is good business policy for a public service corporation. "Do unto others as you would have them do unto you."

EFFECT OF THE SPECIAL OPERATING INSTRUCTIONS.
BY MARY JONES.

THE special operating instructions have been of great help to the Bowling Green exchange. At each meeting we have taken a special subject and after discussing in what way it could be handled for the interest of our company, have put forth a strong effort to carry out the good points brought out in the paper and discussion. I feel we ought to appreciate the opportunity we now have of getting these new ideas and try to make use of them.

I began working for the Bowling Green Home Telephone Company in 1910 and I am glad to say that in these five years I have seen great improvements. I believe the greatest improvement has been in the last eight or nine months since Miss Lusby came over and organized the operators' meetings, and through Miss Duncan they have been successfully carried out. These meetings give us a chance to know each other better and learn each other's views on different subjects and when we *know* each other we can work together to a greater advantage.

Let's all take a new interest in the operators' meetings and our work as well and try to make the year 1915 and the years to come the greatest in the history of the Bowling Green Home Teiephone Company.

"COURTESY"—ITS EFFECT ON THE PUBLIC.
BY MINNIE B. LUCAS.

WE hear a great deal about "Courtesy," that quality which makes one polite, considerate, and accommodating, and it is well that it should be taken into consideration, for of all the qualities one may possess, courtesy is one of the most desirable. The practice of courtesy, many times, causes pleasant relations, where otherwise the contrary would be the result.

Our greatest men and women are invariably courteous. Once, a great statesman, while driving with a friend, met an old negro servant who politely tipped his hat: the statesman, in return, bowed to the negro. His friend, in surprise, asked why he condescended to bow to a negro. The answer was, "I never allow anyone to be more polite than myself." His courtesy was, no doubt, one of the things which made him great. Anyone's greatness may be measured largely by his ability to be polite or courteous to all people at all times. This not only applies to statesmen, or our greatest men and women, but I think it should apply to everyone, whatever their vocation may be.

The telephone operator, whom we all know has so many things to vex and worry her, should at all times endeavor to be courteous, for there is a business phase to it, as well as a moral: For instance, a subscriber calls in, the line is busy, you do not show him the proper courtesy, he gets offended and speaks of the poor service, which, of course, has its influence. The company not only has a dissatisfied subscriber but stands a chance of losing one.

100 PER CENT COLLECTIONS.
BY HELEN BUTTS, CASHIER.

THE exchange today that hasn't a business that produces one hundred cents on the dollar for the service it is furnishing is a failure financially. It isn't quantity that counts, but quality. We might fill the pages of our "Rental & Toll Record" with subscribers, but unless our revenue is realized in the same proportion, we will find ourselves burdened with worthless accounts and all going out and nothing coming in. The better plan would be to solicit only good business, but since this can not always be done in dealing with the public, we should adopt methods whereby the non-paying element will not have an opportunity to get in arrears, thereby making balances accumulate on our books that can not be liquidated.

If possible, bills should be collected every month. This would enable us to reach the 100 per cent mark quarterly instead of semi-annually. A subscriber who can not pay a small account, can not pay a larger one and if allowed to run, we probably lose the account and the goodwill of the subscriber.

As an aid to obtain the 100 per cent standard, there is much that can be suggested. The company should have the heartiest co-operation of its employes from the lowest position to the highest. Every place

connected with the exchange has its reflections upon the work. Considering the construction is in good condition, the service then depends upon the operating force. Operators should do their best at all times to serve the public. The toll work should be handled carefully. Tickets should be made properly, marking correct number of minutes, and Reversed or Cancelled as they should be. The collector's attitude, the cashier's manner and a smile from the manager has its effect. Wide-awake people who approach a subscriber in a business-like manner make him feel that he must meet his obligation. Let's bear in mind that a business can not run on excuses and promises, but in order to be a success it must have its collections reach the 100 per cent mark.

HOW EMPLOYES CAN ASSIST.

By Mattie Backus.

THIS is a question that has been much discussed in our local meetings and is one to which each employe should give more thought and be more interested in.

In the first place, What is business? Webster's definition for it is: Concern—trade—profession—employment. A successful business we would naturally suppose is one that is increasing. The question is, though: "How can employes assist in increasing it?" There are many ways. In fact, it lies almost entirely with the employes of a concern whether or not it succeeds. Employes that are kind, courteous and obliging to their patrons are greatly in demand and are really the making of any profitable and successful business. Our employer has a great deal to do with the success of our plant, but we have equally as important post in this matter.

Be thorough. Know what you are doing. Believe in yourself and others will believe in you. Don't be egotistical. Let others do the praising. Strive to make the concern for which you are working the first and best, putting forth every effort that is in you. Keep your heart in your work. If it can find that you are losing interest, find the cause. If it can be removed, remove it; if not, get into something that you can be interested in.

Back in the Field

After an absence of thirteen years, during which time the art of telephony made rapid strides in improvement, Mrs. Bessie Lewis re-entered the employ of the Union Telephone Company at Owosso, Mich. The first day she was at a loss to understand the improved and scientific methods that had been introduced. The light signals in place of the drop; the increase in the number of operators from six to twenty-five; the number of subscribers from four hundred to two thousand, were marvelous to her. The assistance of the adjoining operator in unravelling and explaining the mysterious methods was greatly appreciated and will ever remain in her memory. The inspiration received from the ease with which the business was dispatched gave her the incentive to endeavor to become an expert. Realizing that it was up to her to become modernized in the new methods, she soon applied herself with a resolution to make good. Her efforts were recognized and she was promoted to the position of supervisor. The management observed her executive ability. Her success as supervisor was assured on account of her ability to obtain the co-operation and team work from the operators, and when the vacancy occurred in the chief operator's position she was the natural candidate on account of her fitness and earnest desire to render the public and her employers service.

She studies very carefully the operating methods of her operators and has introduced such ideas that stimulate their desire to render service, always ready to entertain any suggestion that will work to the mutual advantage of the operating staff and her employers.

"Operators Schools" at Dayton, Ohio

ON May 12, 1915, a preliminary meeting of operators, representing a number of exchanges within a radius of one hundred miles of Dayton, Ohio, was held in the office of the Ohio State Telephone Company, Dayton, Ohio, for the purpose of getting acquainted and of discussing the minor problems of handling long distance messages.

Operators Gathered at Columbus

A. W. Surrell, manager, Dayton district, called the meeting to order, giving an address of welcome, and outlining the object and program of the meeting. Miss Pearl Hemmick of Piqua, Ohio, was elected chairman and Mrs. K. M. Kirby of Columbus was elected secretary of the meeting.

Throughout the entire day there was a feeling of good will and good cheer apparent among all the operators.

On July 1 and 2 the operators and managers from the same territory gathered together again, to discuss the use of the new book of rules published by the Ohio State Telephone Company. The meeting was called to order by A. W. Currell, manager Dayton district, who introduced Henry M. Waite, manager of the City of Dayton. Mr. Waite gave those assembled a very hearty welcome to the city, and as well words of encouragement to the operators engaged in Independent telephony. Mr. Surrell responded to the address of welcome, and was followed by J. C. Boush, general manager long distance division, Columbus.

W. S. Vivian, secretary of the Independent Telephone Association of America, was next introduced, and was given charge of the meeting for the remainder of the school. Mr. Vivian, in his easy, quiet way, so

completely instructed the operators on the proper handling of long distance messages, that each one present expressed themselves on the great benefit derived from the instructions.

The meeting was held in the Beckel hotel, in the main dining room, and luncheon was served in the extreme end of the room, so that very little time was lost between sessions. On Thursday evening the Dayton exchange entertained its guests with an automobile ride about the city, and a vaudeville show at Fairview Park.

Everyone was supplied a noise maker, and there was considerable competition in cheering, between the girls of the O. S. T. (Ohio State Telephone Company) and the boys of the O. S. U. (Ohio State University), the latter being present in equal number at the park.

Overtime

South Bend Home Telephone Company, South Bend, Indiana
By Margaret E. Bernhardt, Chief Operator.

A DAILY overtime bulletin is placed in our retiring room, giving the number of tickets, minutes and revenue.

We have always looked after overtime carefully, but as the tickets were finished they were sent on to the toll clerk and we never fully realized just what we were doing in overtime.

We only had one Calculagraph; that means two operators were responsible for most of the overtime, as the other operators had to depend on a clock fifteen feet away, which hustled them to see the minute works, and the seconds ran away with themselves.

As we kept this bulletin, and the minutes piled higher and higher, the question was: How high would they pile with the required number? I began to make up an extra bulletin, sending one to the manager. It didn't take him but a moment to see we were the losers and had been for years past.

We now have a new Calculagraph, as you will see in our overtime report. In January, 1913, our overtime was 2.3 per cent. In March of 1915 the overtime was 11 per cent, which means $91.33, almost paying for the Calculagraph the first month.

The Ford "Vocal Floorwalker"

One young lady in the Ford organization has sold more than one car over the telephone, says the *Ford Sales Bulletin*. She is the telephone operator at one of our biggest branches. With her businesslike courtesy and her unfailing eagerness to serve, she has built herself a great, big responsible position as the human "point of contact" between that particular branch and the outside world.

She feels the responsibility of her place. She realizes that persons who do business with the company by telephone get their first impression of the company from the one who answers their calls.

She knows she is the "vocal floorwalker" of the branch and that her duties are to see that every one who calls is attended to in a prompt, courteous and altogether satisfactory way.

Hundreds of times each day she has the opportunity of making enemies or friends for the company. She knows that a brusque, discourteous voice may break a sale it has taken a salesman weeks, or maybe months, to bring to the point of closing.

She knows that her prompt and courteous service may change a disgruntled owner into an enthusiastic booster.

In other words, she realizes that the mechanical part of her job is but an incident—her real job is spreading the company's reputation by wire.

There are three parties to a telephone call—the person making the call, the telephone operator and the person called. It is not sufficient that two of these parties at opposite ends of the line do their business properly. The co-operation of the person who connects one with the other is absolutely essential. This particular young lady realizes the truth.

She knows better than to answer the incoming call with a languid "Hello." Instead, she answers with the *company's name*. Then she makes the asked-for connection promptly. If the person wanted doesn't happen to be in, she gets some one on the wire who can take proper care of the call. She never replies in a sing-song voice, "Mr. Smith isn't in just now."

She never is impertinent, grouchy, or flirty. She is a business woman boosting business by giving the best, most intelligent, service at her command.

She speaks in a clear, distinct tone, never hurriedly slurring names and numbers.

She speaks directly into the transmitter in a natural, moderate tone, with lips directly before the transmitter, and not more than half an inch from it. She understands that the correct thing to do in a personal conversation is the correct thing to do in a telephone conversation. So she doesn't say things or use tones of voice when speaking over the wire she would not dare to use if talking with the person face to face.

In short, she realizes that the service she gives is as important as the service given by any other department of the organization.

And she knows that service breeds sales.

How many other telephone operators in the Ford organization are like this operator? They all should be.

New Jersey Installs Automatic

The Hudson and Middlesex Telephone and Telegraph Company is contemplating the expenditure of $1,000,000 on improvements. It has applied to the State Board of Public Utility Commissioners for the approval of a $1,000,000 mortgage, which the company desires to place on its property.

Hearing on the application has been set by the board in Jersey City, N. J.

It is believed the purpose of the proposed mortgage is to give the company funds to build a through line between New York and Washington, and allow it to perfect its automatic system of telephones in Perth Amboy and vicinity. The corporation, since the new interests secured control, has endeavored to popularize the new automatic instrument, which does away with the "hello" girls, and which has worked successfully in several large western cities.

If the corporation is allowed to negotiate the proposed mortgage it is likely that the company will install several thousand of the automatic telephones.

Indiana Independents Announce Convention

At a meeting of the Executive Committee of the Indiana Independent Telephone Association, held at Indianapolis, July 8, it was decided to hold the annual convention at the Claypool Hotel, Indianapolis, Indiana, September 15 and 16.

Telephone Talks

The August, 1915 Installment of an Instructive Serial Course for all Telephone Workers

BY G. W. CUMMINGS AND ARTHUR KNEISEL*

"GENTLEMEN, let us come to order as quickly as possible," announced the President. "Lack of time compelled us to stop a very interesting story at the last meeting. The Switchboardman had intended to tell us about our party line ringing, but got only as far in the building up of the connection as the 'A' board operator's cord circuit. I think he should begin where he left off and tell us about the 'B' operator's cord circuit."

"We discussed the call circuit to some extent and factors which control its efficiency at the last meeting," began the Switchboard man, "and I think we can undertake the interoffice trunk, a circuit of which I have drawn (Fig. 66). At the 'A' end of an interoffice trunk we have simply multiple jacks sufficient for all the operators on duty at one time to reach. The tip and ring of these jacks are connected to the cable conductors running to the second office, and the sleeve connected through a 30 ohm resistance coil to ground. This coil is the same resistance as the cut-off relay and functions in a like manner for supervision. The circuit at the 'B' as shown is for four party selective ringing. When the 'B' operator assigns a trunk to the 'A' operator, the latter inserts her connecting cord plug into the outgoing trunk jack assigned. It is not necessary that she test this jack for busy. The connecting cord supervisory lamp on the 'A' board lights, the current flowing through the lamp and the 83 ohm coil (Fig. 65, July) to the sleeve of the plug, hence through the sleeve of the out trunk jack and the 30 ohm resistance coil to ground. Battery is also flowing through the repeating coil and 118-a relay in the sleeve side of the connecting cord over the sleeve of the interconnecting trunk, through one winding of the 25-a repeating coil at the 'B' end of the trunk, through the 10,000 ohm winding of the 108-E relay, through a second winding of the 'B' end repeating coil, back over the tip side of the trunk and the connecting cord, through the repeating coil to ground. The 108-E relay is puled up, causing the "B" operator's guard lamp to light by the battery placed on the front contact of the 108-E relay through the back contact of the 125-AD relay, the closed contact of the 122-CW relay and the lamp to ground. The 118-A relay of the 'A' operator's connecting cord does not pull up at this time due to the high resistance of the 108-E relay winding, which is in the circuit at the time, and consequently her connecting cord signal continues to burn. Before inserting the trunk plug into the multiple jack of the line called for, the 'B' operator tests the line for busy by touching the tip of the plug on the rim of the jack. If it is not busy she inserts the plug, thereby beginning the ringing of the called subscriber's bell in the following manner: Battery flows through the 122-W and the 125-AD relays in series through the sleeve of the trunk plug and multiple jack, through the winding of the called line's cut-off relay to ground (Fig. 64, July issue of TELEPHONE ENGINEER). If the line called for is either a 1 or a 3 station on a four-party circuit, this battery will flow through an additional 130 ohm resistance. The 122-W relay is adjusted to operate in case there is no additional

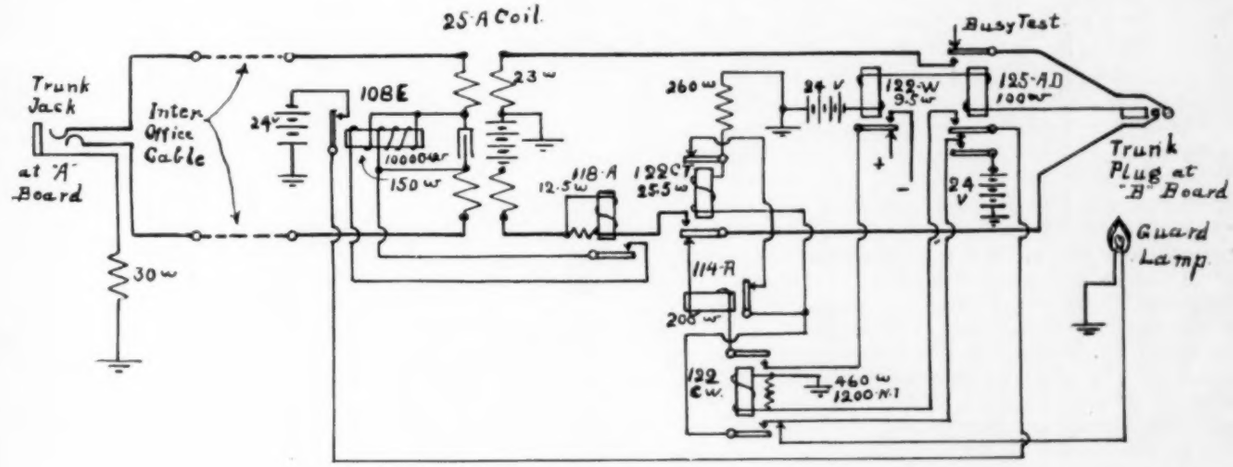


Fig. 66.

130 ohm resistance in the sleeve circuit, and not to pull up when this resistance is included. As soon as the trunk plug is inserted in the multiple jack, the 125-AD relay operates placing the battery from the front contact of the 108-E relay on the winding of the 122-CW relay to ground, which operates this relay. The 122-W relay, in operating, places either positive or negative pulsating ringing current through the 114-R relay on to the ring of the line, depending upon whether the 122-W relay is normal or has operated. This starts the ringing of the called subscriber's bell. The 125-AD relay in operating also opened the busy test circuit and placed battery through the front contact of the 122-W relay which has opened the guard lamp circuit, onto the winding of the 122-CT relay, through 260 ohms resistance to ground. The winding of the 122-CT relay is normally short-circuited through its own back contact and the back

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contact of the 114-R relay and it cannot operate until the latter relay has pulled up and opened this circuit. The 114-R relay is adjusted not to operate when the ringing current is flowing through it and the resistance of the subscriber's bell circuit. However, it does operate when the resistance of the subscriber's circuit is decreased by his removing the receiver from the hook. As soon as the 114-R relay operates the 122-CT relay pulls

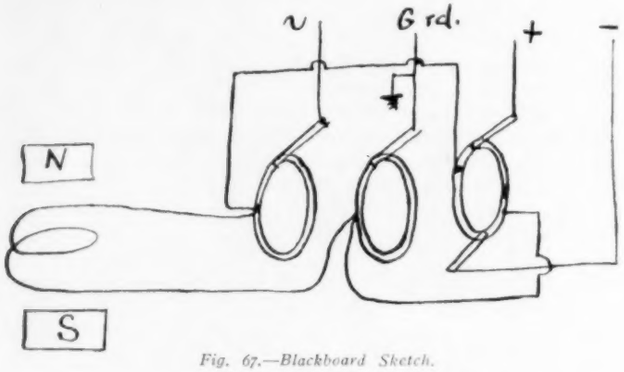


Fig. 67.—Blackboard Sketch.

up, closing the ring side of the cord circuit through and breaking the circuit of the 114-R relay to prevent further ringing. When the called subscriber's receiver has been removed from its hook, the 122-CT and 125-AD relays have closed the tip and ring sides of the cord circuit so that current for transmission can flow through the repeating coil, through the 118-A relay out over the ring side of the line, through the subscriber's transmitter, back over the tip side of the line, through the repeating coil to ground. The 118-A relay pulling up, closes the 155 ohm winding of the 108-E relay. This in turn allows sufficient current to flow through the 118-A relay in the distant 'A' board cord circuit to operate it, thereby extinguishing the connecting cord supervisory signal.

"It might be well at this point to touch upon ringing induction. You will note that during the ringing, the tip side of the trunk is closed through from the called subscriber's instrument to the repeating coil ground of the trunk. In ringing metallic (single party lines), this serves as a return path for the generator current, causing ringing induction by repeating directly through one-half of the repeating coil. In ringing on two- or four-party lines, we ring grounded, and the generator current flows to ground at the subscriber's instrument. We get our induction in this case through a double repeating effect; first from the ring to the tip side of the line and second from the tip side of the line through the repeating coil as in ringing metallic. The mutual induction between the two sides of a line in the multiple of the switchboard alone is sufficient to give a fairly good effect.

"Since a trunk rings automatically until tripped by the called subscriber, a continuous ring would be a nuisance, while its monotony would be less effective in attracting attention. To remedy this, interrupted generator is used, the alternating or pulsating current being passed through either an interrupter wheel on the generator or relays, which are controlled by this wheel. During the silent interval of either Edison current of the same polarity or 48-volt battery is substituted for the generator, to enable the subscriber to trip the trunk during that interval. In some of our offices we ring the bells with alternating current, but for our four-party work we must use opposite polarities of pulsating current. The circuit just described may be used in either case or in case nothing but alternating generator is needed, the 125-AD relay having a 100 ohm winding, is changed to a 125-AE having a 210 ohm winding. The 122-W relay is then omitted, the 114-R relay being controlled directly by the 125-AE relay.

"The polarity of the generator depends on the 122-W relay, and its action is determined by the wiring of the sleeve circuit of the called line. Under normal conditions, with only the 30 ohm cut-off relay between the sleeve of the jack and the ground, the 122-W relay pulls up, ringing negative. For positive parties (1 and 3) on a four-party line, we loop a 130 ohm resistance in the sleeve circuit at the bunching block and the 122-W relay is so adjusted that it will not pull up through the additional resistance, but will furnish positive generator through its back contact. Having the 122-W relay to select the polarity of the ringing current on one side of the four-party circuit, it is a simple matter to care for the other side, by reversing the multiple jumpers of two of the parties at the bunching block of the intermediate frame. It is really very simple. Normally we send ringing current out over the ring side of the circuit, and have a positive and negative pulsating current to make the selection between them. By sending the ringing current for the other two parties out over the tip side, we get the same selction. That is why the multiple jumpers of parties 1 and 3 are reversed.

"I will first show what happens when the parties to a connection replace their receivers and will then proceed with the ringing circuit at the subscriber's station. The called subscriber, having finished his conversation, hangs up his receiver, allowing the 118-A relay of the trunk circuit to fall back. This opens the 155 ohm winding the 108-E relay and thus releases the 118-A relay of the connecting cord circuit, lighting the supervisory lamp and notifying the 'A' operator that conversation has ended. By removing the plug from the trunk jack, the 'A' operator releases the 108-E relay, which in turn releases the 122-CT. When this relay falls back, the guard lamp lights notifying the 'B' operator to take down the trunk cord. The 122-CT relay is released when the 122-CW falls back and it is then shunted out until the 114-E has again been tripped. One advantage of this

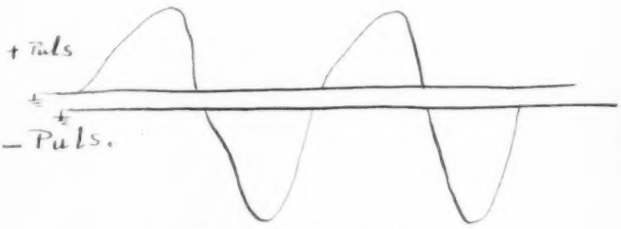


Fig. 68.—Blackboard Sketch.

trunk circuit is that the 'A' operator has control of the re-ring. If the same party is to be recalled, the 'A' operator need not order a new trunk from the 'B' operator. By momentarily removing and reinserting the plug from the trunk jack, she releases the 122-CT and 122-CW relays and starts the ringing again."

"Pardon the interruption; but will you kindly explain how you get the positive and negative ringing currents?

Do you have a separate machine for each?" asked the Contract Agent.

"No. We get the alternating and both the pulsating currents from one and the same machine and it requires but one armature to get them. I will draw a rough sketch of the circuit (Fig. 67). You probably know that an alternating current dynamo is equipped with collector rings on which the brushes ride and that in a direct current machine the brushes ride on the commutator, which is composed of sections insulated from each other. You will note that on the machine indicated, there are but two commutator bars and, according to the circuit shown, the machine is supplying positive current during one-half of a revolution and negative current during the other half, and that one side of the armature winding is constantly grounded. By this plan the alternating current is virtually broken up into two sets of impulses separate from each other and dovetailing (Fig. 68). In each of the two kinds of pulsating currents, the impulse is used to pull a biased bell tapper against the tension of a spring and the interval between the impulses is long enough to permit the spring to pull the tapper back to normal.

"The ringing circuit of the subscriber's four-party set is connected according to which station it is to respond. The circuit in all cases is from one side of the line through the under contact on the switch-hook, through the condenser, through a 3,000 ohm resistance and the ringer coils to ground, the condenser being shunted by a 48,000 ohm resistance coil. In all the ringers installed since 1910, the 3,000 ohm coil is wound on one of the ringer coils. The ringers for all four-party instruments are alike so that it is not necessary to carry in stock as many different kinds of ringers as there are parties on a line. There is a light tension spring by which the armature is normally held against the core of one of the ringer coils. The tension of this spring is just enough to bring the tapper back after the impulse flowing through the coil has pulled it over against the other gong. On stations one and two the tip side of the line is connected to binding post L-2 and on three and four it is connected to L-1. On stations one and three the terminal on the spring side of the ringer goes to the condenser while on stations two and four the terminal on the spring side goes to ground. In connecting up a four-party instrument on this system, it is absolutely necessary that definite knowledge of the station number on the circuit be known for if tension on the biasing spring be weak the bell will 'cross ring,' but when the station number is known and it is properly connected the selection between two parties ringing from the same side of the line is very definite and when once properly adjusted, this system gives very little trouble."

"Can you tell us something about the harmonic system of ringing selectively?" asked the President.

"In four-party selective ringing with harmonic systems, the bells are all connected metallic in series with a condenser," replied the Switchboard Man. "The selection is made by having each of the four ringers on a line tuned to respond to a different frequency. A ringing generator or preferably a set of interrupters supplies four frequencies—16, 33, 50 and 66 (approximately). One of the ringers has a very heavy tapper and is designed to vibrate only when a 16-cycle-per-second current flows through its coils; another has a lighter tapper and responds only to a 33-cycle current, and so on. One objection to a system using currents of multiple harmonics is that often a 33-cycle ringer will respond to each impulse of the 16-cycle current and while not ringing the bell in a standard manner, it will be sufficient to attract attention and is apt to cause a complaint of bell trouble. If the ringers are all carefully tuned and the interrupters of a harmonic system are all adjusted to the proper frequency, this trouble is reduced to a minimum. Such a system, however, often leads to peculiar complaints. I recall a particular case of a lady who said she had a lazy bell and wanted it exchanged for one of those hustle-

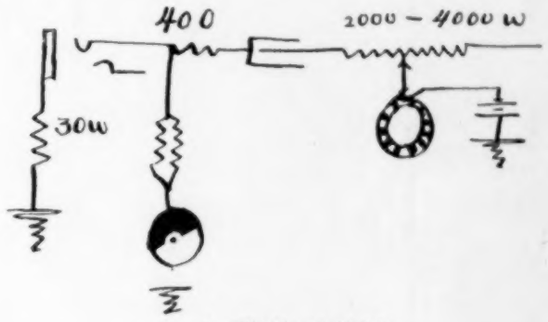


Fig. 69.—Blackboard Sketch.

up, busy-body kind. She had a 16-cycle ringer and wanted a 66-cycle. Mr. C. H. North devised a selective ringing system, which was not open to the objections of cross rings due to sympathetic vibrations on multiple harmonics. In this system the frequencies were arranged in odd steps, such as 16.6, 30.3, 42.4, 54.5 and 66.6 cycles per second. This system is known as the synchromonic system. If the vibrators at the central offices are given the proper attention, this system gives good satisfaction, for aside from gong adjustment there is very little chance for trouble."

"Are harmonic systems ever rung grounded?" asked the Installer.

"Sometimes they are used for eight or ten party selection, particularly on rural lines, in which case the ringers are connected through condensers to ground on each side of the line. In such case it is necessary to connect one side of the vibrator to ground while ringing."

"Would it be possible to use either the harmonic or the synchromonic system in connection with our automatic ringing?" asked the Installer.

"I have not seen a circuit for it. But I have come to believe that, given a sufficient number of relays, a telephone engineer can do anything. However, I do not see why we should consider the matter. The system we use gives satisfaction and is superior in some respects to others."

"I have a question," said the Collector. "How is it that a subscriber gets the busy signal so often?"

"If you mean how he gets the busy signal, I can readily tell you," responded the speaker. "But if you ask why he gets it often, I give up. I am sure he never gets it oftener than is absolutely necessary, for if an operator completes a connection she has satisfied a subscriber, while if anything prevents his getting the party called, he will call again. If an operator were to give a calling subscriber a busy signal when the line is not busy, she would merely be increasing her own work. As to how she gives the busy signal, we will consider the same circuit used earlier in the evening. If the 'B' operator gets a click when she touches the tip of her plug to the multiple jack of the called line, she knows that the line is in use. There is no way for the 'B' operator to communicate this fact to the called subscriber, even if

she had the time to do so. After many expedients had been tried—including a phonograph, which was impervious to verbal abuse and insisted with calm reiteration that the line was busy—the present interrupted buzz was decided upon as giving a simple and reliable signal, whose meaning was readily learned by the public. This buzz is set up by the busy-back wheel mounted on a shaft geared to the generator shaft so as to reduce the frequency to about 150 per second; and to give the interruption to the buzz, a portion of the circumference is left solid. One side of a 2 mf. condenser is wired through a 400 ohm resistance coil to the ring of a busy-back jack multiplied before the 'B' board operators. The other side of the condenser is alternately charged by the office battery through an adjustable resistance of from 2,000 to 4,000 ohms and discharged by the busy-back wheel. It is necessary that the trunk should be tripped, and desirable that the 'A' operator should be flashed; and these objects are accomplished by taking a tap from the jack side of the condenser through two 8-K resistance coils in parallel and through a flashing wheel to ground. The sleeve of the jack is grounded to operate the sleeve relays of the trunk (Fig. 69).

"Perhaps it might be wise to explain the 'tone test' at this time. When calls for a line are to be questioned, as, for instance, when a line is temporarily out of commission, a high-pitched 'tone test' is put on the sleeve. An operator on testing a line and finding tone test (but no battery) on the sleeve will refer the call instead of completing it. When a line is plugged up in the hospital on account of trouble, it is necessary to distinguish the test on it from the ordinary busy test to prevent its being reported busy, which would lead to repeated unavailing calls for it. We accomplish this by superimposing tone test on the sleeve battery of the 'out-of-order' cords of the hospital position. Tone test is set up by sending current from the office battery through the high winding of a special transformer—usually the 54-H, whose windings are 1,030 and 1/3 ohms through an interrupter wheel on the shaft of the ringing generator to ground. The interrupter wheel opens the circuit from 400 to 800 times per second, and this results in an alternating electromotive force of the same frequency in the low winding of the transformer."

"Are there any questions?" asked the President. "Does that clearly answer your question as to how we ring our four-party subscribers?"

"I think I got some of it," responded the Cable-Splicer's Helper. "I will study the record of these discussions and see how much more I can get. Then I will be back with more questions. That part of the talk about transmission losses, shunting losses and self-induction is as clear as mud to me, but I may get more of that after I have asked a few more questions."

"Mr. President, I move we extend a vote of thanks to the Switchboard Man for his instructive talks of the past two meetings. I know that I have learned several points which were not clear to my mind," said the Contract Agent.

"I am heartily in favor of that," said the Wire Chief, "but I think we should amend the motion so as to include the Jumper Man and all the speakers who were kind enough to tell us of their work."

"I will accept such an amendment," said the Contract Agent. "I do not wish to appear unappreciative of the benefits derived from any of the talks, but this one, which touched more upon the operation of our system, naturally appealed to me somewhat more than some of the others."

Motion carried as amended.

Motion to adjourn carried.

(To be continued.)

Should Operators Be Considerd in Rate Making Costs?

Telephone operators should be considered in rate-making costs, according to the engineer of the Chicago Telephone Company, who testified before the rate commission in the investigation of the Wisconsin Telephone Company.

Mr. McGovern's assertion put forward three new propositions:

What is a telephone operator worth to the company for rate-making purposes?

Does her presence add to the physical valuation of the company's plant so telephone rates can be made higher?

After her value for rate-making purposes has been ascertained, has the telephone company the right to demand an 8 per cent return on her added "physical value?"

Mr. McGovern asserted that the company demands an allowance for the efficient organization which it has built up, having been forced to expend considerable money for the building up and to educate the operators.

The city, however, will oppose any proposal to fix value on the operators for rate-making purposes.

Mr. McGovern, who appeared as an expert, rather favored the telephone company in his figures, and placed the estimated value of the plant at $6,928,032. Other experts did not agree with him, and one placed the value as high as $8,000,000.

Detroit to Investigate Telephone Service

The Michigan State Telephone Company must bear the expense of the investigation by the city of Detroit into its appraisal and audit. The cost of the appraisal and audit will not exceed $15,000 and must be completed within five months.

Professor Edwin P. Burch, who was associated with Professor Edward W. Bemis in the appraisal, is to be engaged by the city to appraise the property of the telephone company. The Detroit Trust Company is to audit the company's books.

The only phase of the agreement which city officials fear the railroad commission will oppose is the provision requiring completion of the appraisal and audit within five months.

The commission adjourned its hearing on the telephone company's request for metered rates until September 3. Information that the company's records are very vague, especially during the period prior to the receivership three years ago, has convinced the comptroller and corporation counsel that the work cannot be completed for several months, so the five-month provision was inserted.

Under the caption "Vital Switchboard Considerations" the Western Electric Company sends out a large folder about semi-automatic operation with Western Electric central battery, central equipments, arranged for automatic ringing, automatic listening, and automatic flashing recall.

The Telephone Scrap Book

Curious and Useful Items, More or Less Telephonic, Gathered from Everywhere

TERMITES (white ants) seriously injure construction timbers in bridges, wharves, and like structures; telephone and telegraph poles, hop poles, mine props, fence posts and rails or boarding; lumber piled on the ground, railroad ties set in the ground (not where there is stone or slag ballast or heavy traffic), woodwork is new and old buildings, and especially seriously damage the wooden boxing or "conduits" of insulated cables placed in the ground (to the detriment of the insulation); tent pins and ridge poles, wooden beehives and tree boxes; wooden electrotype blocks, and books and documents stored in damp, dark places, etc.; timber in contact with the ground being especially liable to serious damage. Often the damaged material has to be removed and replaced, or rebuilt. The wood of no species of native tree of commercial importance is "immune" to attack, although some are relatively more resistant than others. Such damage has occurred as far north as Boston and the shores of the Great Lakes, but greatly increases as the Tropics are approached. In the southern states termites are especially destructive to wooden underpinning, beams, and flooring and all other material of wood accessible in buildings. They enter buildings by means of tunnels through the ground, by way of wooden joists, or by means of covered paths (minute "sheds" constructed of earth and excrement of the superficial consistency of sand), leading to the woodwork over the surface foundations of stone or other material which they can not penetrate. This enables them to avoid the light. Thus termites silently, secretly, and ceaselessly work their insidious damage, instinctively never perforating the exposed surface of timber, except to enable the sexed adults to swarm. Sometimes the emergence of these winged forms is the first indication of their presence, but at other times joists and floors collapse without warning.

Fig. 1—Chestnut Telephone Pole, With Base Charred, But Basal Area Untreated. This Pole Has Been Standing Near Dover, N. J., for Eight Years. (Photograph Loaned by United States Forest Service.)

Forest products in contact with the ground should be impregnated with coal-tar creosote, which is a permanent preventive against attack by our native termites. Coal-tar creosote has many properties which would recommend its use in this respect, for it is also a fungicide, and being insoluble in water, will not leach out in wet locations. These requirements furnish objections to many chemicals that otherwise are very effective insecticides. The various methods of superficially treating timber, as by charring, by brushing, or by dipping with various chemical preservatives, among which are creosotes, carbolineums, etc., have proven to be temporarily effective in preventing attack, if the work is thoroughly done. If not not thoroughly done, termites enter through the untreated or imperfectly treated portions, especially through weathering checks and knots. Where the bases of poles, etc., are left untreated termites enter the timber from below, and, avoiding the treated portions, come up through the interior. Charred timber is effective against termite attack for a period less than a year, although it is not seriously damaged at the end of one year. It will readily be seen that neither brushing nor spraying the exterior after placement, as is sometimes practiced, is effective in keeping out termites, since the portion that sets in the ground could not be treated, and it is usually at this point that termite attack occurs.

Fig. 2—(a) Abandoned Burrow of Lymexylon Sericeum in Solid Wood of Chestnut Telegraph Pole, in Which a Fertilized True Queen Was Found; (b) Cell Excavated in Decaying Wood by Young Royal Couple.

Before treating timber with chemical preservatives, especially where the brush method is employed, it is essential that the timber be thoroughly seasoned, otherwise penetration by the preservative will be retarded.

A treatment with "blue oil" is recorded as apparently effective in protecting wood against the attacks of "white ants," or termites, besides acting as a preservative (fungicide) generally. "Blue oil" is the residue left in the distillation of mineral oils after the isolation of kerosene (petroleum) and paraffin; (*a*) the oil to be a shale product; (*b*) its specific gravity (at 60° F.) to be 0.873 to 0.883; (*c*) its flashing temperature to be not lower than 275° F. (close test).

Many patented wood preservatives, advertised as effective against wood borers, often merely contain simple preservatives, as for instance, linseed oil, to which a slight odor of oil of citronella has been imparted, or contain simple poisons. For timber to be set in the ground, brush coatings with linseed oil are not effective against termites.

An English firm manufactures a saccharine solution which probably contains a salt as arsenic; this patented treatment is supposed to be efficient against wood-boring insects, especially termites. The wood is seasoned by immersing in the saccharine solution at 120 to 140° F. This process is being tested.

Impregnation with chlorinated naphthalene may prove effective against termites, as a preservative for woodwork, in interior finish, where a requirement is that the preservative should not "sweat" out, or stain the wood. Treated wood blocks buried in the ground with termite-infested logs were not attacked after a test of

nearly six months. Impregnation with paraffin wax was not effective. If the wood is not in contact with the ground, impregnation treatments with bichlorid of mercury and zinc chlorid are effective. The mercury and zinc in this form are both soluble in water.

In general, serious damage by termites to the wood of fire or insect killed, standing, merchantable timber can be prevented if the timber is utilized within from one to two years from the time that it was killed, depending on the species of wood and the locality—one year for pine (less in the southern states) and two years for chestnut.

Forest tree nursery stock should be planted in ground that has been plowed deep late the fall of the year in a region where injury by termites is common.

Certain species of wood appear to be naturally highly resistant to termite attack. Species of wood that, so far as determined by test, have been resistant to attack by our native termites are all tropical species and woods too expensive for ordinary use, including teak from Siam and Burma, greenheart from South America and the West Indies, "peroba" from South America, and mahogany from tropical America. The presence of tyloses or of gums may be factors in determining the durability and resistance of hardwood species. Hagen states that, while teak is not destroyed by termites, he believes that even teak will be attacked when it has become old or been long exposed to the air. Hagen states that it is useless to consider tannin as a preservative, since, according to Williamson, termites will destroy leather. Some species of woods native to the Philippine Islands are apparently immune to termite attack.

Hemlock and redwood are badly honeycombed by our native species of termites on the Pacific coast, and California white cedar is honeycombed by the termites of the Pacific coast.

European cypress is reported damaged by termites at Rochefort, France.

Cedrus deodar, from India, and *Cedrus atlantica*, of the mountains of northern Africa, are reported to be immune (?) to termite attack.

Red "deal" is less liable to attack than white "deal."

The following three species of wood remained untouched by termites for three years in the District of Pretoria, Transvaal: "Leadwood," "black ironwood" and "vaalbosch."

In case of certain species of pines, with an extremely resinous heart-wood, as the "fatwood" of the longleaf pine of the southern states, while termites honeycomb the sapwood, the heartwood apparently is resistant. Odenbach states that turpentine is very repellent to termites in artificial nests. In southern Rhodesia the wood of the "mopani" tree withstands termite attack for years, and is therefore very suitable for straining posts for fences.

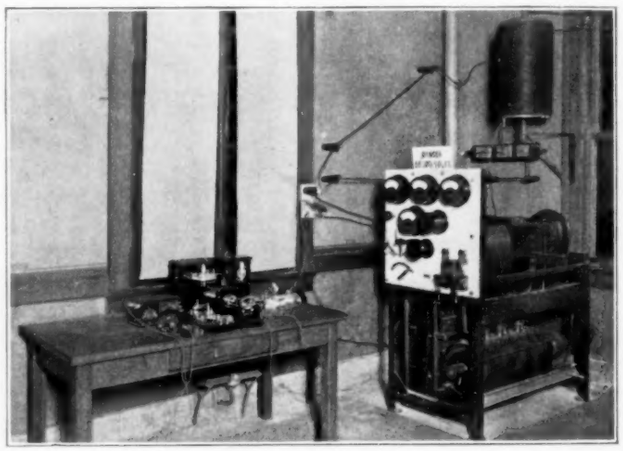
Tests of the relative resistance of various native and exotic woods have been begun, but as yet no definite conclusions can be drawn. The heartwood of the following native species of wood is relatively more resistant to attack by our native termites: Black locust; black walnut (cases on record where heavy beams supporting flooring in a building in Baltimore, Md., were completely honeycombed; eastern white cedar; eastern red cedar or juniper; bald cypress of the southern states; western red cedar of Washington, Oregon, and California; incense cedar of Oregon and California; and Monterey cypress of California. All these species of woods, however, are attacked by termites.—*Bulletin No. 94, Part 2, U. S. Bureau of Entomology.*

Unique Wireless Time Signal Station

THE accompanying illustration shows the electrical equipment of the wireless time signal station at the observatory at Springfield, Ohio, of the Illinois Watch Works. It is stated that the engineers at the Illinois watch plant, recognizing the fact that the great convenience and accuracy of wireless time signals insures a rapid development of this system of time distribution, lost no time in getting into the field to supplement the service of the Naval Observatory, whose wireless signals from the station at Arlington, Va., at once marked a distinct advance in this line of public service.

It is pointed out that in the short period since the "Arlington" wireless time service was instituted hundreds of jewelers throughout the United States and Canada have equipped themselves to utilize these signals. The service is the last word for accuracy, seldom varying from true time more than two-tenths of a second and usually within less than five-hundredths. In addition to their availability for jewelers there are thousands of amateur receiving stations that daily and nightly make use of the signals. In a short time there will be but few educational institutions down to the high school grade that will not be equipped with a wireless station.

While it may be thought that the government service



Electrical Equipment of Time Signal Station.

from the Arlington station would be sufficient for all needs, it is true that a duplication of the signals at different hours is a real convenience and the hours of sending from the Illinois observatory are better adapted to the needs of the central time zone than the 12:00 noon and 9:00 p. m. hours, Eastern time, adopted by the Naval Observatory. It also gives an opportunity to receive time four times in 24 hours instead of twice.

It is stated that the signals from this wireless station and observatory are sent one hour later than the Arlington noon signal and one hour earlier than the evening signal; that is, they are sent at noon and at 8:00 p. m., central time. To those unacquainted with the method of transmitting time, it may be mentioned that the signals from either source are identical and consist of dashes of about a quarter-second duration transmitted each second with certain regular breaks for purpose of identification. The series begins at 5 minutes to the hour, ticking regularly with exception of a break at the 29th second, and from the 55th to the 59th. This latter break is varied on the last minute of the hour by an interruption of ten

seconds before the final signal, which is a long one, beginning exactly on the hour and lasting a full second. With this series of breaks there are ten points of reference in the 5 minute series for purpose of identification and comparison.

It is of interest to note that the transmitter used at this Springfield wireless station, while not as powerful as that of the Naval station, is yet capable of a readable range of 1,000 miles. Its power, 10 kw., is probably greater than that of any inland station in the United States. The type is known as the rotary quenched spark. It is operated on 220 volts, current from the city supply.

There are no elaborate towers. The three wire aerial nearly 600 feet long is supported by masts 100 and 140 feet high. A receiving station is such a simple affair that they are multiplying rapidly in all parts of the country. Many an ambitious country boy listens nightly for the time and gets it with an accuracy unsurpassed. The Illinois Watch Company has a large correspondence both with jewelers and other amateurs who either are reporting the reception of their signals or are seeking advice as to proposed stations. All possible assistance is rendered the latter class.

Everything indicates a rapidly increasing vogue for wireless time service. There is also a great fascination in wireless as a recreation. The code is easily learned and messages received from stations in all parts of the country. The general weather forecasts sent from the Arlington station each evening, and the Illinois forecast from this Springfield station, are also of interest and utility.

To establish a receiving station it may be of interest to know that an excellent receiving instrument need not exceed $25.00 in cost, while $5.00 will easily cover expense of material for aerial and the cost of maintenance is negligible. The photograph shows the receiving and transmitting apparatus. The transmission of the time is automatic, the key being operated directly by the clock through a relay and break circuit wheel in the clock escapement. The signals are sent on a wave length of 2,000 meters. This differs so much from the usual commercial lengths that interference is avoided.

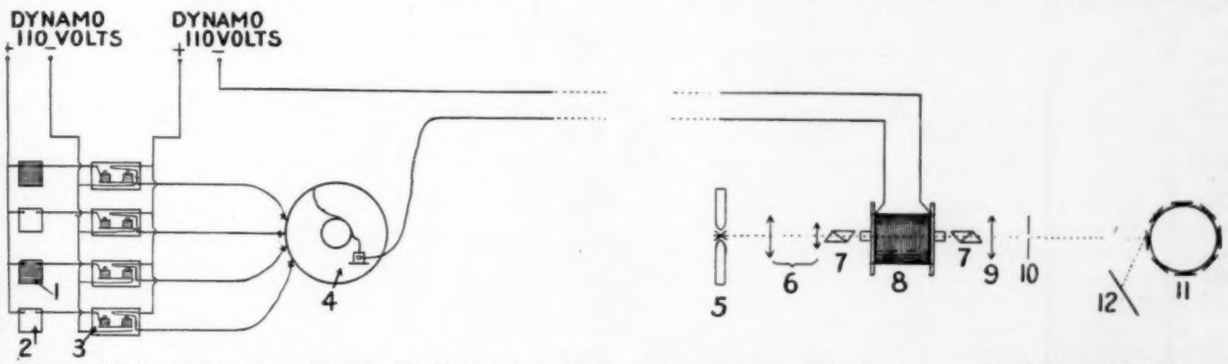
Telephotographic Apparatus of Rignoux

FOR a very long time physicists have been trying to solve the problem of seeing at a distance and as science has already made such marvelous conquests—the telegraph, the wireless sending signals, and the telephone conveying the sound of the voice to a distance, and now also without the intervening wire, that television, seeing at a distance, seems no longer merely an impossible dream, says R. Arapu in *Scientific American Supplement*.

The present story has to do with some experiments which Prof. Ruhmer in Berlin, Edouard Belin in Paris, and Georges Rignoux at la Rochelle, have been conducting. These have been in progress for some years, and have just reached a stage that is filled with interest, for it has been possible to recognize simple form reproductions transmitted by electric impulses in a distant city.

Rignoux, who is a young physicist of la Rochelle, sometime since devised an apparatus to which he gives the name Telephote, but which required a large number of wires, as many as there were of luminous points constituting the original image. Latterly, he has been able to simplify the Telephote to a marked degree, and just as the telephone transmits over a wire graduations and quality of sounds so the Telephote will transmit the lights and shadows for the defining of an illuminated image.

The Telephote requires two wires between the sending and receiving stations, in addition to one for synchronizing the machines at the two places, and is based on the general principles illustrated in the accompanying diagram. A suitable concave mirror, parabolic by preference, concentrates upon the object whose image it is



1—Selenium Cell Not Illuminated. 2—Selenium Cell Illuminated. 3—Electromagnets (Relays). 4—Relay Collector. 5—Arc Light. 6—Projecting Lenses and Condenser. 7—Nicol Prisms. 8—Solenoid. 9—Projecting Lens. 10—Diaphragm. 11—Revolving Mirrors. 12—Screen Receiving Image. Telephotographic Apparatus of Rignoux.

desired to transmit the beam of a Nernst lamp of 2,000 candle-power, and the image of the original thus illuminated is projected by means of a lens upon a mosaic of 64 cells of selenium. It is not necessary here to do more than note that the electrical resistance of selenium varies according to the amount of light which it receives, a property which has caused it to be made the foundation of many experiments of the kind.

Such a mosaic is capable of transmitting various figures and combinations of signs, the current passing to the selenium being of 110 volts. Each cell that is illuminated attracts the armature of its own electro-magnet, but if there is no light there is no movement of this armature. The result of the projection of an image upon the mosaic will be that certain cells close armatures that permit currents to flow, and these currents are sent to a "collector" which rotates 450 turns a minute, and the collected currents are delivered to the line by this device.

At the receiving end the impulses are conducted to a solenoid or coil, the axis of which is hollow. The beam of an arc light is directed by condensing and projecting lenses upon a nicol prism, and then passes through the solenoid. When it emerges it comes upon a second nicol prism that is reversed to the first, and the normal result is that the second prism entirely stops the light already polarized by the first. The effect of the current through the solenoid is, however, to change the plane of polariza-

tion of the beam of light, and make it possible to pass the second nicol. It is then caught by a lens, passed through a diaphragm which holds back all but the central rays, and these fall on mirrors fixed to the periphery of a wheel. A convenient screen receives the reflections from the turning mirrors, and on this screen will be seen the transmitted image of the distant original.

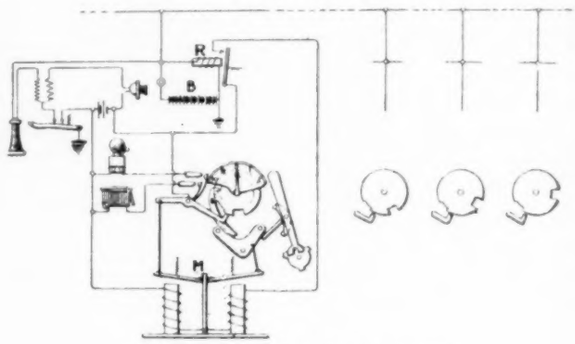
Dr. Rignoux has succeeded in sending in this way, by means of the Telephote in his laboratory, the images of the letters of the alphabet, H, T, L, and U among them, and the photographs shown are taken from these images. By removing the screen the eye can catch the images on the mirrors, but not as sharply.

Thus far these investigators have not attempted to send any half-lights, but are now experimenting with this end in view. To obtain an image of a person it will be necessary to have a selenium mosaic of from 3,000 to 4,000 cells. It is believed also that in time the receiving screen will not be necessary, and when this is dispensed with the image formed will be much stronger and clearer. The present intensity of this image is weak. Dr. Rignoux and his associates do not claim that the problem of television is solved, but the report that they make is an interesting statement showing that important advances have really been made.

Telephone That Tells Who Called

ON a single-wire party-line telephone circuit near Constableville, N. Y., says *Electrical World*, each subscriber is provided with a telephone instrument equipped not only with a selective ringing attachment but also with a device to inform the subscriber who, if anyone, called in his absence. The instruments were constructed under specifications covered in a patent issued to P. G. Bernholtz, Constableville, N. Y. They differ from the standard ground-return telephone in that a special battery has been added to the local circuit and a visual signal or drop, as well as a bell, has been arranged to operate through an especially designed selective-signaling mechanism.

To call a subscriber on a line equipped with these instruments it is necessary to close the special battery (B) circuit through the push-button. The special battery operating all relays (R) on the line unlocks all instruments. The indicator then moves automatically to the desired number, and when the line is again energized the selective-signaling apparatus in the called subscriber's instrument rings the bell and operates the visual signal or drop. Other instruments return to their normal positions. If it so happens that the called party is not within earshot of the bell, he notes on his return that the visual signal has been operated. He then places his indicator on R and energizes the line by means of the special battery, ringing all bells on the line, but failing to actuate any of the visual signals because the indicator was set at position R. Hearing this call and observing that the visual signal has not been disturbed, all subscribers understand the signal, and only the one who previously called and failed to obtain the individual with whom he desired to communicate is supposed to answer.



Circuit Diagram of Party-Line Telephone.

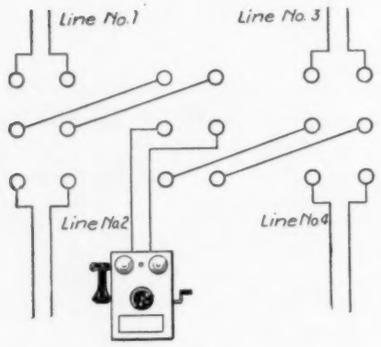
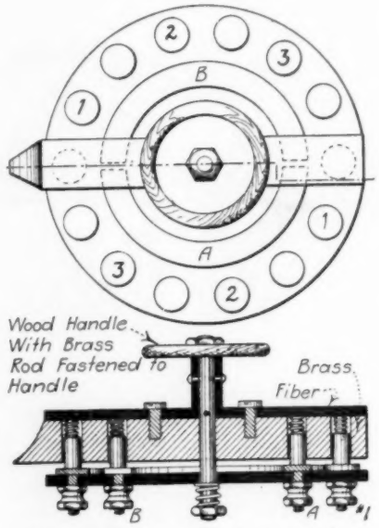


Fig. 1—Old Method of Switching.



Intercommunicating Telephone Switch.

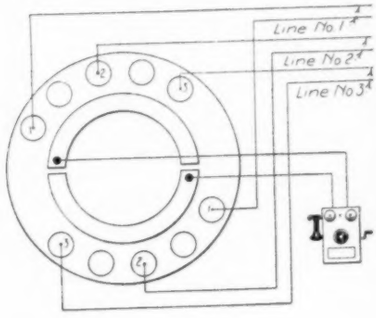


Fig. 3—Connections to Switch.

Intercommunicating Telephone Switch

THE power company for whom I am working has several telephone lines entering one of its generating stations, says J. D. Lewis in the *Electrical Review*. The former method used was unsatisfactory. Extension bells had been installed on each line and the common double-pole baby knife switches were used for connecting the various lines to a local telephone set, giving communica-

tion with the calling party. (See Fig. 1.) It took some time to make the connection, as well as familiarity with the different combinations to be made.

There are, of course, small switchboards and even local-battery wall telephones on the market, equipped with cords and plugs arranged in a practical and efficient manner, but none of these was on hand and the following idea was worked out. It has proved to be rapid and now operators can learn the system of switching with less confusion than with plugs and jacks and cords.

A piece of fiber, slate or marble is cut into a circle with pins of the required number inserted around the edge, every other pin having no connection on back side and being a dead pin, to prevent possible short-circuiting of the lines or tying them together. The pins were made of brass machine screws with heads filed flat.

Two pieces of semicircular brass are mounted near the inside on the base (*A* and *B*, Fig. 2). A cross-connecting bar of brass is in two parts connected together with a fiber strip. Two pins of brass are inserted with a spring in each end of the bar and connected electrically together. One end of the bar is pointed and indicates the line where it stands. The two wires from the telephone are connected to the semicircular pieces of brass (*A* and *B*) and the line wires for line No. 1 are connected to the pins marked 1 opopsite to each other across the disk; line No. 2 to the two pins marked 2, and so on around the switch (Fig. 3). Now the operator wishing to connect his telephone to line No. 1 moves the bar, which is provided with a circular handle in the center, until the pointer shows 1. The line wire from No. 1 is connected up through the pin from the bar, down to *A*, thence to the telephone, returning to *B*, through the cross bar, down the pin to the other side of No. 1 line.

It can be seen that the operator can instantly switch to any line desired; there are no cords to become loose or broken; no switch handles come loose or switch blades tighten or loosen up as they do after continuous use; and the simplicity of the operation over any other method for eight lines or less is apparent.

Northern Indiana Association Meets at La Porte

The annual meeting of the Northern Indiana Telephone Association was held at La Porte, Ind., following opening activities, which were in the way of a banquet at the Hotel Rumely.

The La Porte Telephone Company was host at the banquet, to which about 35 representatives of various companies were present.

The banquet started at 7 o'clock and following an excellent dinner, short talks were given by several of the representatives. Congressman H. A. Barnhart, who is interested in the telephone company at Rochester, was one of the speakers and his remarks were very interesting from the telephone company's standpoint. Other speakers were J. C. Kelsey and F. V. Newman of Grand Rapids. The talks were in general and many good points were brought out that were very helpful. President Samuel Tomlinson of Plymouth talked about organization and what could be accomplished by co-operation. Daniel Agnew of Plymouth and E. E. Dacey, who is manager of the South Bend plant, also gave short talks. The lady speakers were Mrs. Samuel Tomlinson and Miss Bernetha, the latter of Rochester.

During the evening delightful music was rendered. The City band serenaded the telephone men with several numbers, after it had completed its concert in the court house square.

At the business session this morning, all of the old officers were re-elected as follows:

Samuel Tomlinson, president, Plymouth, Ind.

Claude R. Stoops, secretary-treasurer, Nappanee, Ind.

Directors—Elmer E. Dacey, J. W. Scott and Daniel Agnew, V. P.

Of especial interest during the meeting was the address on "Our Compensation Law," by C. W. Mercer.

Other items on the program were:

Address, F. V. Newman, secretary, Michigan, Indianapolis, Toledo and Traffic Association. Subject: "What Makes for Efficiency in the Operation of Toll Lines."

Round Table Talks, conducted by J. C. Kelsey.

Address, G. R. Johnson, vice-president, Ohio State Telephone Company. Subject: "Efficiency Through Co-operation."

After miscellaneous business, the meeting adjourned and the representatives enjoyed an automobile ride through and near La Porte.

The place for the next meeting is left to the board of directors, which will get together sometime in July or August. It is believed that a school for the operators will be organized at that time. The directors will also choose the place for the next annual convention.

Tennessee Forms Association

Independent telephone companies of the lower Cumberland Plateau, which is situated in middle Tennessee, held a large and enthusiastic meeting at Carthage, Tenn., on July 1. There were present over 250 delegates. The object of the meeting was to organize an association for the general improvement of telephone conditions, and there is little doubt but that the organization will be a big success.

The organization committee is composed of J. L. McCarver, of Haydenberg, Tenn., J. W. Taylor, and Mr. Ward, of Sparta, Tenn. They have all been successful in handling their respective territories, and have been able to practically eliminate competition. W. N. McAnge, Jr., secretary of the Southern States Independent Telephone Association, Corinth, Miss., was present at this meeting, and it is hoped that when the association is permanently formed, that it will affiliate with the Southern States Association as the lower Cumberland Plateau District of the Southern States Telephone Association.

Ohio State Announces Earnings

Net earnings of the Ohio State Telephone Company for the month ended May 31 were $55,201.13, according to the report issued by President S. G. McMeen. The net for April was $58,359. The report shows revenues of $268,802.22, with expenses, including taxes and insurance, of $167,560.25, producing a net income of $101,241.97. Fixed charges for the month inclusive of interest on bonds, totaled $46,040.84. Disbursements on the preferred stock amounted to $26,-087.98, leaving an unassigned balance of $29,113.15, which is available for depreciation, sinking fund requirements and dividends on the common stock. The unassigned balance at the end of April was $32,271.

Convention of the company's long distance operators from ten surrounding counties, which has been in progress at the Hartman Hotel, ended successfully.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

New York

THE Public Service Commission has decided that the charge of 50 cents a month for extension telephones is not an unjust or unreasonable one. The decision is on the complaint of Milford D. Whedon of Granville, against the New York and Vermont Home Telephone Company.

The New York Telephone Company, which controls the telephone system in Auburn, was allowed to intervene as a party in interest, and its studies and the investigations of the commission have taken much time. The commission previously decided that a telephone subscriber has not the right to install his own extension telephone set, as the telephone company is responsible for the standard and efficiency of service which might be interfered with by equipment over which it had no control.

An interesting phase of the situation brought out by the witness of the telephone company is that the placing of an extension telephone increases the number of messages 15 per cent on a flat or message rate line. This testimony was based on extensive studies of the company's business all over the state, and, while, of course, it is not exact, it was testified to by the telephone company witnesses as the best of their belief.

Taking this percentage of increased business as a basis for the added cost to the company of the extension telephone, further studies all over the state led the telephone witnesses to testify that the added traffic expense was 59.5 cents per year, the added commercial expense 69.2 cents and the annual plant charge $3.13.

The Public Service Commission of the State of New York has settled the complaint of the West Somerset Cold Storage Company against the New York Telephone Company as to its service and charges from the Barker exchange. The commission has ordered that a four-party service be established in place of the present multi-party service at a base rate area charge of $21 for business and $15 for residence service, plus a mileage charge of $2 per quarter mile beyond the base rate area.

At one of the hearings before Commissioner Hodson the company proposed this settlement of the difficulty and the complainants agreed to all of it except the mileage charge. The commission finds, however, that the mileage charge is one in state-wide force by the company, and that a change in this charge for the present case would involve an extended inquiry into the reasonableness of the charge throughout the state. This would take at least a year and would, during that time, hold the present complainants without relief. The commission specifically holds the reasonableness of the mileage charge open for further investigation on complaint or upon its own initiative.

By the terms of this order the complainants, among the largest fruit growers and shippers in the state, and who, during the season, are in constant and pressing need of adequate telephone facilities, are relieved of the present overcrowded multi-party lines, some of which now must serve as many as eleven subscribers each.

The company is ordered to put into effect the four-party line service at the above rates on August 1, and is authorized to accept the payment of the mileage charge pending the determination of the commission as to its reasonableness.

Missouri

Both a defeat and a victory was won by the Southwestern Telegraph and Telephone Company in a ruling of the Missouri Public Service Commission on the application of the company for an increase of its rates for business service in St. Louis.

The application has been pending since December 1, 1913. The application is denied, but Judge Kennish holds that the present rates for business telephone service in St. Louis are unreasonably low and the company is ordered to file a new schedule for approval of the commission, lower than the one denied and higher than the present rates.

The commission fixes the value of the property of the St. Louis exchange of the company at $8,500,000. On this basis the present earnings of the company in St. Louis are 5.26 per cent. The commission will approve a schedule calling for 6.50 per cent. Under the schedule turned down the earnings would have been 7.11 per cent.

Plans to present information to the Missouri Public Service Commission in opposition to the Joplin Home Telephone Company's application for an increase in rates have been arranged.

It was authorized by acclamation to appoint a committee of twenty-five persons to prepare an intervening petition to the commission for a public hearing in Joplin to determine the quality and value of service provided by the company.

California

The California Railroad Commission has taken under advisement the application of the Pacific Telephone and Telegraph Company for a certificate of public convenience and necessity to operate under a franchise in the city of Emeryville. The town was not represented, although the commission had a letter from the town trustees acquiescing in the granting of the certificate. The Franchise had been originally granted to the Home Telephone Company of Alameda County and finally passed into the hands of the Pacific Company.

Washington

Whether or not the telephone companies of Washington are to be allowed to require deposit from customers of the $5 deposit before installation of telephone will be made, will be finally decided at a hearing of the Washington Public Service Commission in Seattle, August 5.

There are 186 telephone companies in the state to-

be affected by the decision. The $5 deposit is said to bring a great many thousands of dollars to the companies, and unlike the deposit necessary before gas installation service, for instance, no interest is paid to the customer for his deposit, and if the telephone is taken out before the expiration of a year, the deposit is lost.

Two hearings have been heard on the matter since September, 1914, when the commission initiated the proposed change. Many telephone companies have entered objections.

New Jersey

The Paterson Chamber of Commerce has begun the collection of data which will probably be submitted to the Public Utility Commission in the near future, in an effort to obtain uniform telephone toll rates.

For some time past a number of complaints have found their way to the Chamber of Commerce regarding the apparent disregard for the proximity of surrounding communities in the application of the New York and New Jersey Telephone Company's toll rates. The charging of a toll of five cents to telephone to Passaic, Little Falls and Ridgewood has been objected to by many, who point out that similar distances in other parts of the state enjoy a flat rate, with no extra charge to subscribers and only the usual five cents to pay station users. Instances are also recalled where two different communities of approximately the same distance from Paterson are operating under different toll rates. Residents and merchants of Paterson who have occasion to telephone to these communities many times during the course of a month cannot understand why double tolls are charged for conversational intercourse with some communities of approximately the same distance as others.

A long list of the various objections from telephone patrons has been compiled and the work will be continued until the ground is fully covered. Then the petition will be presented to the commission asking for an investigation of the toll rates for the purpose of establishing some uniformity.

Minnesota

The Minnesota State Railroad and Warehouse Commission has taken over the control and supervision of telephone companies in Minnesota beginning July 1. It finds that it has been given a very large contract with a very small expense appropriation.

There are at present nearly 2,000 telephone companies in Minnesota. The commission is given the task of regulating the rates charged by all these companies, seeing that the tolls are fair and reasonable, guarding against discrimination and attending to complaints against them and all this on a sum of $5,000.

There are 1,600 telephone companies in Minnesota that are paying taxes and about 100 more that are on the list to pay in the office of the public examiner. The records of the business of these companies are on file at the examiner's office and this will save some of the initial labor in connection with collecting statistics.

Complaints and queries are already coming at the office of the commission both from companies and users of telephones, but the replies are being made that the commission is not yet in a position to give expert advice on the subject.

Some of the telephone companies are adjusting their toll rates in accordance with the air line distance of the call in anticipation of the policy which will likely be adopted by the railroad and warehouse commission.

Wisconsin

W. R. McGovern, chief engineer of the Chicago Telephone Company, testifying before the Wisconsin Railroad Commission hearing on telephone rates, stated he had prepared an exhibit, now in the hands of the commission, in which an allowance of a per cent of the gross receipts of the Wisconsin Telephone Company is made for the company's engineering department.

The assistant city attorney attacked this plan, claiming an overlapping, on the contention. The engineering department is one of the items which makes up the 4½ per cent of its gross receipts paid by the Wisconsin company to the American Telephone and Telegraph Company. Mr. McGovern replied that the engineering division of the parent company does the scientific research work for all of the companies, while the engineering corps of the associate company do the field work or the installing and operating of apparatus planned and perfected by the engineers of the parent company. The hearing will be resumed sometime in the next sixty days.

The property of the Wisconsin Telephone Company is valued at $8,000,000 by an expert employed by the company.

It is valued at $3,225,267 by an expert employed by the commission to make the valuation. The solution as to which valuation is right, must be made by the three commissioners.

The higher valuation was made by William A. Jackson of Detroit, a recognized telephone expert. The lower figure was given by the commission's engineers, who have been at work upon the task for five years. This latter figure does not include the "going value," which the telephone officials say is $2,000,000, nor the working capital, which is estimated at $100,000. The telephone company asks a rate that will produce an 8 per cent annual earning dividend on the physical valuation.

Indiana

Through the work of Commissioner Edwards of the Indiana Public Service Commission the largest telephone case yet presented to the commission, in so far as discriminatory rates are concerned, will soon be settled. The case is that of the Southern Telephone Company of Indiana, the Indiana branch of the Cumberland Telephone and Telegraph Company. The decision involves the telephone business in forty-four cities in the southern part of the state and will result in a total saving to the patrons of $1,000 annually, whereas the company desired a total increase in revenue of about $18,000 a year.

The case was presented to the commission many months ago and has been the subject of evidence ever since. The company in its early history had permitted rates to be established in some cities which were almost confiscatory, and had endeavored later to nullify this condition by charging other consumers with an increased rate.

In some communities a subscriber was charged $1

for residence telephone service in one instance, and in another, where the service was similar, a neighbor was being charged $1.65 a month. Business telephones were being permitted to escape with a rate as low as $1 a month where the business man was influential, and residence telephones were being charged at a higher rate.

The decision will not prevent any one of the companies or any of the cities from asking for a revision of its rates at any time. It means all discrimination will be abolished.

A hearing by the Public Service Commission of Indiana will be held in Jeffersonville, on the petition of the Cumberland Telephone & Telegraph Company to adjust its rates in that city. The company desires to increase the minimum rate to the maximum.

Hearings have been held in two towns of Southern Indiana last month. It is probable that the petition of the company to adjust the rates by raising them to the highest now charged will be resisted by local subscribers enjoying the lower rate.

Pennsylvania

Pennsylvania State Public Service Commission has fixed July 27 as the time, and the Senate caucus room in the Capitol at Harrisburg, as the place, for a discussion by all parties interested in the questions and considerations involved in the proposition of prescribing uniform telephone rates to be put into effect by telephone companies throughout Pennsylvania, with especial reference to the record of the investigation made so far by the commission with this end tentatively in view.

The commission suggests a broad discussion of the whole subject and that, among other things, the discussion might be directed toward the fundamental consideration as to whether, under the provisions of the public service company law conferring upon the commission authority to fix maximum rates, the prescribing of a schedule of uniform rates for the entire state could be worked out on some basis which would operate for the public convenience and to the benefit of the public service; or, upon the other hand, whether the nature of the subject matter is such as to require, in the interests of the public service and convenience, that telephone rates be regulated by the commission according to the varying circumstances and conditions that may be peculiar to different communities and localities throughout the state, rather than that an endeavor be made to reach a conclusion upon certain bases of classification suggested by the tentative uniform rate schedule originally promulgated at the outset of the investigation.

The proposed schedule of telephone rates for Pennsylvania, the biggest of the legacies left with the Public Service Commission by its predecessor, is to be taken up next month and disposition made of the problems this fall. The proposed schedule, which was worked out for the entire state, and which will affect every line from the big systems to the small farmer lines, was prepared by the old commission after eighteen months' study of the situation, and led to the first physical valuation proposition undertaken by the commission, this resulting from the objections filed by the Bell Telephone system.

The commission has set July 27 and 28 as the date for the final argument.

At the request of the Public Service Commission of Pennsylvania, the Central District Telephone Company is to present arguments favoring the fixing of telephone rates in Johnston, Pa. Some months ago a decree was handed down compelling uniformity in rate charging by the Bell and local telephone companies in Pennsylvania. The commission now asks the companies to present their sides of the question: Shall there be a uniform rate, or a series of rates based upon local conditions? The hearing is scheduled for Harrisburg next month.

Until a few months ago local telephone charges from Johnstown to Ebensburg were 15 cents for three minutes. The Bell charged five cents for five minutes; and upon complaint of the local company the rate at present on both lines is 10 cents for three minutes, which does not mean connection with the party desired, but only with that party's telephone.

It is understood that the public service commission rather leans toward the rates fixed upon local conditions.

If the proposition to fix a maximum rate for service to cover the entire state is abandoned, the commission proposes to regulate telephone charges according to varying circumstances and conditions in each community.

Colorado

The Colorado Public Uilities Commission is preparing to begin an investigation of telephone conditions and charges in Colorado.

It is thought the telephone investigation will take up five or six months of the commission's time. Not one phase of the industry will be overlooked, and the smallest and the largest towns and communities are to be given the fullest consideration.

In the matter of rates, the commission does not contemplate any wholesale decrease in rates. But when all conditions have been probed, when every complaint has been registered and examined, the commission will make such orders as seems equitable. If an increase in rate was merited from the showing, it will be allowed as quickly as a reduction, it is asserted.

One of the conditions that will be fully investigated and which will be the subject of an attempt at equalization is the toll line situation. It is declared that in many cases the company has dropped local service in certain districts and placed the subscribers on toll lines, thus increasing the charge for service. Any community having this complaint to make will be asked to file statements with the commission.

Giraff Walk Off With Telephone Wires

At a recent meeting of the Institution of Electrical Engineers in London, W. L. Preece told of the damage done to telephone systems in the tropics by animals. The giraffes in East Africa, he said, have not sense enough to duck their heads when they find a telephone or telegraph wire across their tracks, but push on and carry the wires, and sometimes the poles, with them.

White ants eat the telegraph poles if these are of any wood but teak. He showed a telephone instrument that had been used as a hive by bees, which entered by the slot for the switch hook and formed inside a comb that was renewed as often as it was cleared away by the engineers.

European Telephone Development

Translations from the Foreign Press and Communications from European Engineers

BY FRED W. SCHOLZ

IN case telephone lines have trouble it is essential that repairs be made immediately and that there be some way of localizing the difficulty at once. Finding the seat of the trouble is easiest if there are numerous points of control from which sections of line can be studied at shortest notice. The supervisory boards in exchanges are, therefore, equipped with cut-off jacks on panels which can work very rapidly. In order to test any line on which trouble is reported, relays have lately been used, one of which is shown in Fig. 1.

For each line to be controlled, for example for line *1*, there are two relays, *Ra* and *Rb*, each connected respectively to wire *a* and *b*, which are connected to a trunk wire *1* which passes to the testing room. The wires of the subscriber's line are connected to the contacts of the relay in such a manner that, when the relay armatures are at rest, the "west" section is directly connected to the "east" section. In order to assure good contacts for wire *a*, the back contacts *1* and *4* are mounted in parallel, and in branch *b*, the contacts *5* and *8* are parallel. If current is sent from the test room to the trunk wire the relays *Ra* and *Rb* attract their armatures and the conductors *a*/*b* of the "west" branch and of the "east" branch are connected to the return circuit wires by contacts *2*, *3*, *6*, *7*, and then to the instruments in the test room. In case several lines are to be tested, the same return circuit to the test room is used. Consequently for each subscriber's line it is sufficient if one disposes over one special trunk test line with the two *Ra* and *Rb* relays. Where the subscribers' lines are too far away from the exchange to make it possible to test them direct from the exchange, boxes with test relays and apparatus can be placed on telephone poles at regular intervals. In order to save in conductors from the test poles to the exchange, it is possible to use the return circuit to the exchange for test purposes. For

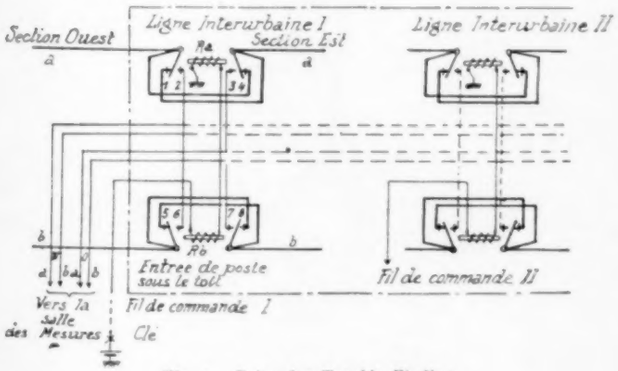


Fig. 1. Relay for Trouble Finding.

the same reason it is possible to reduce the number of trunks that are supposed to be the same number as the number of circuits by using the wiring shown in Fig. 2.

Between the exchange and the control telephone pole a wire is connected with two instruments S_1 and S_2. When current impulses are sent by means of key t_1, the arms A_2 of S_2 pass over the contacts *1*, *2*, *3*, etc. These contacts connect respectively to test relays *RaI*, *RbI*,

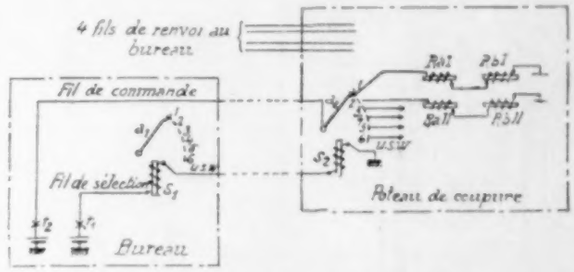


Fig. 2. Wiring to Reduce Number of Trunks.

RaII, *RbII*, etc., of the different subscribers' lines *I*, *II*, etc. At the point where arm A_2 rotates the trunk wire passing to the exchange is connected. This arrangement works as follows: By means of the selecting wire, the arm A_2 is brought to the contact which is connected to the two relays of the subscriber's line to be tested. Then the relays are operated by pressing on key T_2 and the two sections of the subscriber's line are connected to the return circuit to the exchange. The apparatus S_1 placed in the exchange acts synchronously with S_2 and shows by the position of A_1 on what contact arm A_2 is found at any one time. For S_2 one could, for example, use a selector which does not return to its rest position, and which is provided with 10, 20, or more contacts. For S_1 one might very well use a telephone conversation registering apparatus. If, for example, S_2 has 20 contacts, the ten-digit and the unit-digit finders of the counter would permit us to read the position of A_2 without difficulty. If the counter showed to figure 4332, it would mean that A_2 was on contact 12. The conditions of testing are particularly hard for test devices placed on telephone poles owing to atmospheric conditions and it is well to take precautions to safeguard the apparatus and also to use insulated wires where possible. The apparatus should also be mounted in an accessible place and should be inspected at regular intervals.—*Annales des Postes, et Telephones.*

TEST WITH A NEW AUTOMATIC DEVICE ON PARIS TELEPHONE LINES.

In order to utilize the work of the telephone operators as well as possible, it has been tried to group several of the trunk office wires coming from other Paris exchanges in the switchboards of the central exchange. Two telephone lines are then connected to the switchboard of the one B-operator with the result that at times, especially when a large number of A-operators use the wires at the same time, there are confused noises which trouble the B-operators and

give trouble. In order to relieve this trouble of poor hearing all that is necessary is to see that no more than one line be connected to any operator at one time and that any other A-operator entering on the B-operator's line at that time be prevented from disturbing the line. Fig. 3 shows the wiring for the device which is to remedy this trouble.

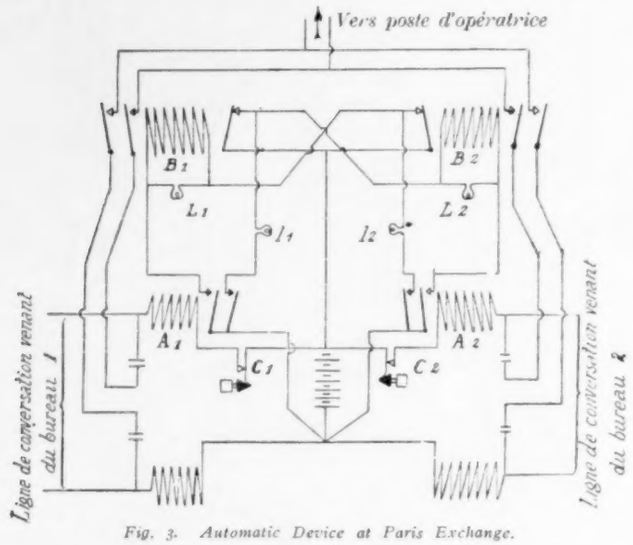


Fig. 3. Automatic Device at Paris Exchange.

When an operator A of exchange *1* presses on her calling key, she connects the telephone line to her instrument, the current of the common battery then passes over relay A_1, which is attracted; the circuit of relay B_1 is then closed over the battery by means of the back contact of the armature of relay B_2. The armature of relay B_1 is attracted and as a result the telephone line of exchange *1* is connected to the operator B. At the same time lamp L_1 lights, indicating to the latter operator that an operator in her exchange wishes to speak to her.

If an A-operator of exchange *1* should press down her calling key, an A-operator in exchange *2* would answer and connect, the relay A_2 would operate. But the relay B_2 is not under current, for the circuit of this relay is cut off by the back contact of the armature of relay B_1. The B-operator will then remain connected to exchange *1;* meanwhile the lamp l_2 remains lighted, showing that an operator of exchange *2* is calling. As soon as all the operators of exchange *1* have left the line open, the operator B is connected automatically to the telephone line of exchange *2*, which is calling, for at this moment the armature of relay B comes back to rest and the relay B_2 operates, the lamps l_2 and L_1 go out and lamp L_2 lights up.

If at a time of heavy traffic, a large number of outgoing traffic operators should call at the same time, and exchange *1* should block the B-operator too long (indicated by lamp l_2 being lighted too long) it is sufficient for the B-operator to press for an instant on the button of cut-off C_1 to bring the relay B_1 back to rest, and in permitting relay B_2 to operate, to connect with exchange *2*. The lighting of lamp L_1 or lamp L_2 indicates the exchanges with which the operator is connected; the A-operators, therefore, need not announce the number or name of the exchange and thus save some time ,which is of great importance in times of heavy traffic. The above device is used in the Marcadet exchange of the Paris telephone system with good results.—*Annales des Postes, Telegraphes et Telephones.*

PARIS TELEPHONE SERVICE FOR ABSENT SUBSCRIBERS.

Les Annales des Telephones bring a short notice of service which is rendered to absent subscribers at their request and a special rate of 30 francs ($6.00) per year. In addition a tax of 20 centimes (4 cents) has to be paid for each message received and delivered to its destination. The subscriber may leave his office at any time and notify the exchange operator, a special switchboard being used, to receive any messages that might come to him at the time. The device which permits this call service is much simpler than the one used in the Wagram (German) exchange, notice of which was given at the time in TELEPHONE ENGINEER. The Paris device does not use a magneto, which is necessary in the other one. The telephone line of the subscriber with this call service is split into two double wires starting from a distributing frame on a special switchboard. The subscriber, when leaving his office, will ask for the special service, his call coming to the operator by an ordinary number disc, the operator replying as usual. The operator, by pressing a button, will disconnect the line so that all calls coming from the exchanges for this subscriber will reach her and the messages be given to her. On the other hand, the subscriber will connect his telephone to the operator when he returns in the usual way. When the subscriber returns, the operator, before giving the messages, will press down the button of the special service device and will thus test whether he has a right to receive the messages and prevent them reaching the wrong person. It seems then that a special number is used, which must be given to the operator by the subscriber before messages are delivered. When the subscriber on returning has used his special receiver for this purpose and has received the messages, the operator will withdraw the proper plug and connect his line again in multiple as it was previously.

USING TELEPHONE CIRCUITS FOR TELEGRAPH WORK.

The telephone circuits of Frankfurt-Berlin, and also those of Paris-Bordeaux, were changed so as to permit simultaneous telephone and telegraph communication on the same wires and increase their capacity to the utmost.

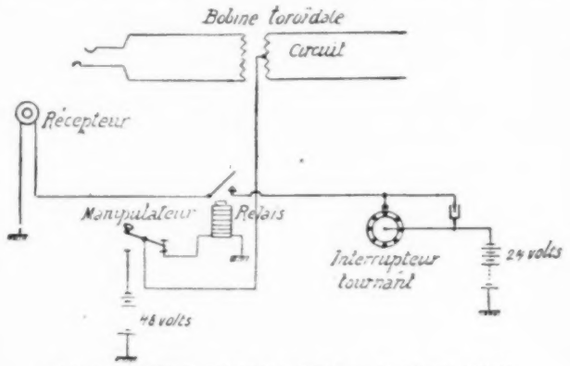


Fig. 4. Telegraph-Telephone Work on the Same Wires.

(Figs. 4 and 5.)

The telegraph currents are received in a relay, whose armature, when it is attracted, closes a circuit,

over which interrupted currents pass. These currents are produced by a battery, whose circuit is interrupted periodically by an interrupter consisting of two carbon brushes in contact with a disc, on whose circumference are insulated bars or segments. The disc carries 20 insulated bars and makes 1,200 r. p. m., which is equivalent to 20 revolutions per second, so that the sounds heard in the receiver are equal to 400 vibrations per second. The receiver was at first a special instrument fixed at the end of a tube. The operator could thus bring it to his free ear at any time. As a result of tests it seemed better to receive the telegraph signals in an ordinary receiver fixed to the headband of the telephone operator. In this case the receiver of the operator is connected in circuit with the vibrator only when a special key is pressed down. This key (Fig. 5) is placed in such a way that, when at rest, the attraction of the armature of the telegraph relay lights up a call lamp which is to attract the attention of the operator.—*Annales des Telegraphes et Telephones.*

INFLUENCE OF EXCHANGES CONNECTED WITH EACH OTHER ON CONVERSATIONS.

When placing telephone lines in sparsely settled sections with little traffic, it is often necessary to connect several communities in one central exchange so as to get at least some degree of economy. If conversation is not to be influenced by this practice, special care must be taken in equipping the exchanges. Aside from the losses which the telephone currents suffer in their connection through the various exchanges to the subscribers, with all the lightning protective devices, fuses and cut-outs, etc., there is the added danger that conversation will be interfered with by the telephone instruments that are needed to call up the exchanges and to supervise traffic.

The Austrian telephone system, where the above practice is necessary, follows this practice: For connecting the overhead wires in the exchanges, they always use single conductor lead cables with vulcanized rubber-covered conductors. Two types are used which really differ only in the size of the copper conductor: rubber-lead cable with 2 mm. (.08 in.) copper conductor and 5.7 ohm resistance per km. (0.6 mile) and with specially important lines of 4-5 mm. (1.62 in.) bronze wire; for other wires rubber-lead cables with copper conductors of 1.38 mm. (0.05 in.) diameter and

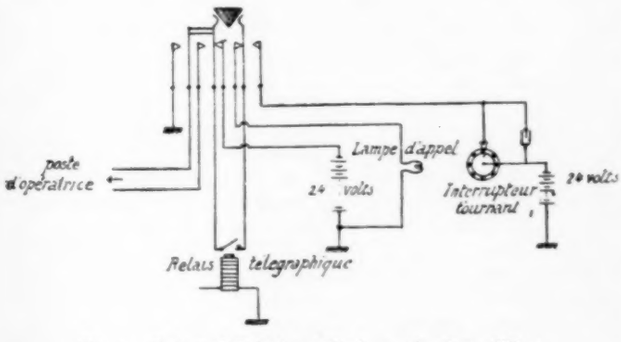


Fig. 5. Telegraph-Telephone Work on the Same Wires.

12 ohms are used. The strength of the lead cover is 1.2 mm. (0.048 in.) with both types and the rubber insulation 1.32 to 1.35 mm. (0.0528 to 0.054 in.). The capacity for the heavier type is about 0.22, for the smaller about 0.19 microfarad per km. These lead cables are used in all exchanges with a small number of subscribers and reach in this form of cable up to the back of the switchboard itself. In spite of the small copper resistance, the damping effect of this cable is

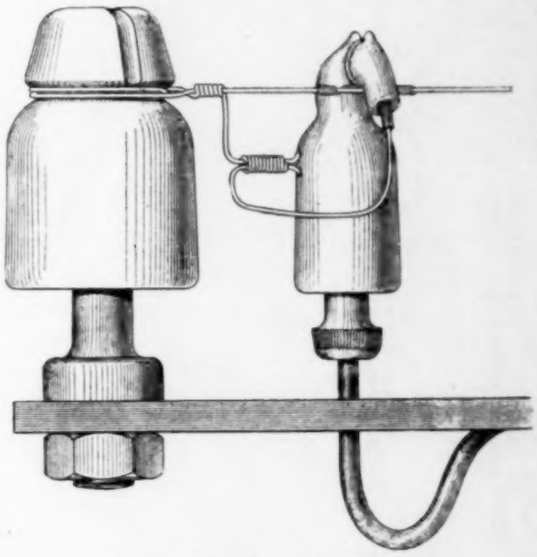


Fig. 6. Insulators for Cable Connections.

fairly large on account of the high capacity, the great dielectric losses in the rubber insulation and the eddy-current losses in the lead sheath. The cables are fairly immune against atmospheric influences and against the weather. In order that the insulation at the place of connection of cable to line shall not be injured, special insulators are used, as is seen in Figs. 6 and 7.

The insulator is of porcelain, whose upper portion is in the shape of a hollow drawn-out extension. In the interior it has a saturated packing which can be compressed by means of a hollow, threaded porcelain connecting piece. The bore hole in the packing is kept open as long as the cable is not passed through the same by an iron tap, which is withdrawn when the cable is to be introduced. The end of the lead cable is laid bare of its lead covering for a distance of 20 cm. (8 in.) without cutting the rubber insulation and then the rubber is cut to a point. Then it is passed and drawn through the bore hole until protruding at the other end and drawn out a ways and then connected to the telephone wire either one way or the other, depending whether the wire is connected in a horizontal or a vertical position. The portion of the cable protruding from the bent end is then shaved clean of the rubber insulation and connected with the telephone wire by taping or binding wire.

The switchboards which are used in such exchanges are built up on the following principles, as Fig. 8 shows. The branches of the various telephone lines reaching the exchange are passed to the cut-off keys K_1, K_{11}, K_{111}, of which K_1 and K_{11} are used for communication of subscribers of the local exchange over one or the other branch of the telephone line, whereas the outside telephone calls from distant subscribers or other exchanges connected are received over K_{111}. The exchange itself is called by means of the alternating current calling bell *W.G.* which is

TABLE I.

Line Triest-Zara.	Total Copper Resistance of Double Line, Ohms.	Total Insulating Resistance of Each Branch in Megohms. a	b	Frequency $W=2\pi n$.	Short Circuit Resistance Uk.	No Load Resistance Ul.	Characteristic $Z=\sqrt{Uk.Ul.}$	Total Damping B_T.
Without Exchange	890	0,66	0,47		1065 e — 19° i	865 e — 5° i	959,8 e — 12° i	1,2629
Without Exchange	845	0,46	0,52		1060 e — 17° 30′ i	870 e — 5° 10′ i	960,3 e — 11° 20′ i	1,3088
Without Exchange	880	0,66	0,47	2500	1067 e — 18° 30′ i	865 e — 5° i	960,7 e — 11° 45′ i	1,3155
With Lussin Exchange Connected	830	0,66	0,47		1075 e — 18° 50′ i	855 e — 5° 20′ i	958,7 e — 12° 5′ i	1,2504
With Lussin Exchange Connected	825	0,66	0,47		1070 e — 19° i	860 e — 5° 30′ i	959,4 e — 12° 15′ i	1,2612
With Lussin Exchange Connected	830	0,66	0,47		1070 e — 18° 50′ i	860 e — 5° 30′ i	959,3 e — 12° 10′ i	1,2643
Without Exchange Connected	830	0,020	0,018		880 e + 14° 10′ i	1097,5 e + 0° 33′ i	982,7 e + 7° 22′ i	1,2589
Without Exchange Connected	847	0,007	0,008		910 e + 16° 17′ i	1022,5 e + 3° 20′ i	964,4 e + 9° 48′ i	1,3772
Without Exchange Connected	870	0,280	0,250	3000	895 e + 14° 40′ i	1155 e + 1° i	1016,7 e + 7° 50′ i	1,2342
With Lussin Exchange	805	0,020	0,018		762,5 e + 13° 45′ i	1090 e + 1° i	911,4 e + 7° 22′ i	1,1281
With Lussin Exchange	817	0,007	0,008		815 e + 14° 30′ i	1205 e + 4° 50′ i	978,7 e + 9° 40′ i	1,1473
With Lussin Exchange	820	0,280	0,250		900 e + 15° i	1140 e + 2° i	1013 e + 6° 30′ i	1,2486
Without Exchange	850	0,300	0,240		935 e + 15° 20′ i	830 e + 32° i	880,9 e + 23° 40′ i	1,2835
Without Exchange	845	0,380	0,340	3500	935 e + 15° 30′ i	835 e + 31° 20′ i	883,6 e + 23° 25′ i	1,2971
With Lussin Exchange	815	0,300	0,240		925 e + 15° 20′ i	810 e + 31° i	865,6 e + 23° 10′ i	1,2871
With Lussin Exchange	812	0,380	0,340		923 e + 15° 20′ i	850 e + 30° 45′ i	864,6 e + 23° 10′ i	1,2908
Without Exchange	835	0,020	0,018		805 e + 27° i	835 e + 16° 58′ i	819,9 e + 21° 59′ i	1,5545
Without Exchange	848	0,040	0,029		820 e + 29° 5′ i	850 e + 10° 17′ i	834,9 e + 24° 11′ i	1,5372
Without Exchange	840	0,028	0,025		810 e + 30° 30′ i	850 e + 17° 10′ i	829,8 e + 23° 50′ i	1,4114
Without Exchange	848	0,040	0,029	5000	815 e + 29° i	850 e + 19° 20′ i	832,3 e + 24° 10′ i	1,5664
With Lussin Exchange	805	0,020	0,018		790 e + 27° 30′ i	837,5 e + 17° i	813,4 e + 22° 15′ i	1,5180
With Lussin Exchange	812	0,040	0,029		785 e + 31° 35′ i	850 e + 17° i	816,7 e + 24° 17′ i	1,3585
With Lussin Exchange	810	0,280	0,250		810 e + 30° 35′ i	850 e + 18° 55′ i	829,8 e + 24° 45′ i	1,4752
With Lussin Exchange	812	0,040	0,029		790 e + 31° 50′ i	850 e + 17° i	819,5 e + 24° 25′ i	1,3489
Without Exchange	849	0,020	0,018		407,5 e — 23° i	362,5 e — 25° i	384,3 e — 24° i	1,7451
Without Exchange	848	0,040	0,029		407 e — 22° 21′ i	355 e — 24° 3′ i	380,1 e — 23° 12′ i	1,6761
Without Exchange	848	0,040	0,029	7000	405 e — 22° 20′ i	365 e — 24° 40′ i	384,5 e — 23° 30′ i	1,7943
With Lussin Exchange	820	0,020	0,018		415 e — 23° i	370 e — 24° 25′ i	391,8 e — 23° 38′ i	1,7662
With Lussin Exchange	812	0,040	0,029		410 e — 22° 30′ i	360 e — 24° 35′ i	384,2 e — 23° 32′ i	1,6932
With Lussin Exchange	820	0,020	0,018		412 e — 23° i	368 e — 24° 30′ i	389,4 e — 23° 45′ i	1,7703

TABLE II.

Telephone Line. Triest-Pisino.	Total Copper Resistance of Double Line in Ohm.	Total Insulating Resistance of Each Branch in Megohms. a	b	Frequency $W=2\pi n$.	Short Circuit Resistance Uk.	No-Load Resistance Ul.	Characteristic $Z=\sqrt{Uk.Ul.}$	Total Damping Effect B_T.
Without Exchange Connected	930	0,70	0,63	5000	650 e + 48° 40′ i	795 e + 4° 20′ i	718,8 e + 20° 30′ i	0,7993
With Three Exchanges Connected	590	0,70	0,63		755 e + 41° 30′ i	835 e + 6° 20′ i	793,9 e + 25° i	0,8863
Triest-Pola.								
Without Exchange	1130	0,30	0,17	5000	615 e + 11° i	765 e + 0° i	685,9 e + 5° 30′ i	1,2492
With Six Connected Exchanges	739	0,30	0,17		740 e + 19° i	822,5 e + 34° i	780,2 e + 21°	1,3268
Without Exchange	1140	0,28	0,22	7000	770 e + 35° i	620 e + 23° 45′ i	690,9 e + 29° 22′ i	1,2879
With Six Exchanges Connected	742	0,28	0,22		770 e + 32° 40′ i	862,5 e + 18° 40′ i	814,8 e + 25° 40′ i	1,3489

bridged into the line circuit. As long as the exchange is not communicating with any long distance line, this calling bell, aside from the cut-outs and fuses, is the only piece of apparatus in the exchange which is connected to the telephone line. In order to reduce the harmful practice of listening in, and also of secondary noises in the receiver, the telephone instruments in both branches leading to the exchanges have a choke coil each of 150 ohm resistance and 3 henrys self inductance. Special attention had to be paid to the a. c. calling circuit in the system, which has to be very sensitive to the currents used to call the exchange and ring the call bell and at the same time exert as small a damping influence on the telephone currents passing through the exchange as is possible. A special a.c. call system is used, which will be described in a later issue, having a d.c. resistance of 4,000 ohms and a self inductance of 100 henrys.

The following data show the results of a few damping tests on the lines with connected and disconnected alternating current call bells. The characteristic of a switchboard system of the type described with all the fuses and cut-outs with the outside cable connections of 3.3 feet lengths is, without the a.c. call signal system, with a frequency of 5000: $Z=2370\,e^{+42°i}$; the damping effect on the telephone currents was $\beta 1=0.0125$. With connected calling bell the characteristic increased to $Z=2442\,e^{+31°i}$ and the damping effect decreased to $\beta 1=0.0100$. If longer cables are used for connection from the overhead wires the characteristic of the exchange decreases more and more, and with lengths of 160 feet the characteristic with the calling bell connected is $Z=950\,e^{+40°i}$; the damping effect $\beta 1=0.0250$ and without the calling signal system it is $\beta 1=0.0280$.

Of special interest was the investigation as to the damping effect of telephone currents on the 307 km. (184.2 miles) telephone line Triest-Zara when the Lussinpiccolo exchange is connected into the line. The Triest-Zara line was especially expensive as about 36 miles had to use submarine telephone cable. It seemed necessary from the economic standpoint to connect the Lussinpiccolo exchange into the line and yet the communication between Dalmatia and the Austrian crown provinces was not to suffer through this practice. Table 1 gives in brief form the results of these tests and the averages drawn from the same source.

Frequency.	Damping Effect without a. c. bell.	Same with a.c. bell.
2500	1.296	1.259
3000	1.290	1.174
3500	1.290	1.289
5000	1.517	1.425
7000	1,738	1.743

In general it seems that the introduction of the new exchange into the system has led to no excessive damping effect. If several exchanges are connected into a long distance line at irregular intervals the damping effect is always increased but only to a comparatively slight degree, as Table 2 shows. In the line Triest-Pisino the increase in damping effect due to connecting three exchanges with their a.c. call bells is $\beta 1=0.087$. In the Triest-Pola line six such exchanges are connected and the effect for a circuit with 5,000 frequency is $\beta 1=0.078$ and for one with 7,000 frequency $\beta 1=0.061$. In no case is it excessive.—*Telegraphen u. Fernsprech Tech.*

SUPERVISING TRAFFIC IN SEMI-AUTOMATIC EXCHANGES.

The Posen, Liegnitz, Dresden and other large city telephone exchanges have been equipped with calling or supervisory operators even though their equipment calls for semi-automatic system and may be changed to the full automatic system at any time. This was a new step in the development of the semi-automatic exchanges, especially in a large semi-automatic exchange like that in Dresden, where some 190,000 connections are made each week of which number about 19,000 fall into one hour of heaviest traffic each working day. A call operator has to make from 400 to 450 connections per hour and any trouble in the automatic equipment, no matter how small, may lead to serious difficulties. Trouble, whether due to the public, or to the operators, or the equipment, has to be remedied immediately if traffic is to go on without trouble.

To supervise the call operators in the semi-automatic exchanges, a special supervisory system was installed. For this purpose the two branches of the microphone coils as also three special wires from the

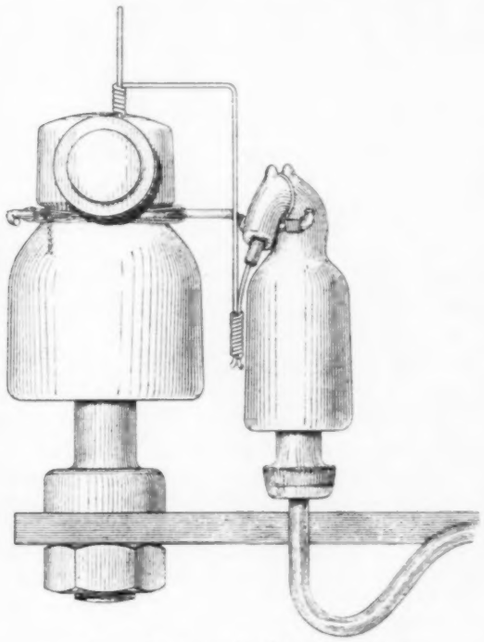


Fig. 7. Insulators for Cable Connections.

automatic selector sets were connected to the contacts of a relay. If this relay is excited by pressing a button or laying over a rocking key, these five lines are connected to the supervisory operator. The latter on her side can connect her line to any other line or any operator without the latter knowing that this is being done. The two branches of the microphone coil connect the telephone circuit of this operator parallel to the receiver of the supervisory operator, as soon as the relay of any one operator is excited and the supervisor can follow the conversation between operator and subscriber. Of the three wires connected to the automatic set, one is connected to the armature of a relay lying within the wires, over which the current impulses are sent to the selector switches. Through this wire the same number of current impulses are sent to the supervisor's telephone as are sent to the automatic set of the subscriber. The second branch connects a supervisory call lamp parallel with the call lamp of the operator watched. This lamp lights up as soon as the operator receives a call. The third wire is to influence the cut-off relay of the connected operator's position in such a way that this operator can receive no further calls from the outside, if the supervisory operator should connect her telephone with the former. As each operator's position has two sets of keys and has, therefore, two automatic sets, each operator's position must be connected to the supervisory switchboard with 2 x 3 branch wires aside from the two wires from the microphone coil.

The equipment for the supervisor's is a small switchboard. The front part of the switchboard has for each set of keys five ten-part lamps, whose caps have the numbers 1 to 0, which are lighted up by the lamps behind them. Beneath these are two larger lamps, the left used for calling, the right for supervisory lamp. Beneath that are the keys to connect with any operator's position. In the interior there are for each lamp set, six ten-contact selectors, five of which are used for connecting the lamp circuit, the sixth for connecting or disconnecting. The action is as follows:

If an operator connected to this supervisory board receives a call, the call lamps of both operator and supervisor light. The supervisor hears the answer of the operator, also the number asked and reply by the operator. The operator then sets the keys for the required number and the selector arms follow the number of impulses sent and set the right number, which impulses are at the same time communicated to the supervisor as well. Here the arrangement is such that the first impulse series (10,000-set) passes through the rotary electro-magnet of the first ten-section selector and that its contact arm is set on the contact corresponding to the right contact. At this place lies the number with its corresponding lamp, which latter lights and shows the supervisor what number has been called. This same play is repeated for all the digits until the entire number called appears on the illuminated board in front of the supervisor. If all lamps have lighted and the automatic sets returned to their original positions, the lamps go out automatically. As both sets of all operators are connected to the supervisory desk, their work can be watched at all times.

The influence of this system was quite apparent at larger exchanges like Dresden where new operators were found to make as many as 3 per cent errors at first until better acquainted with the work. Under the influence of this supervision this percentage was reduced very quickly. But it is also possible to obtain valuable results for study of traffic conditions without the knowledge of the operators studied.

The operator in the semi-automatic system is busied with a call only from the time her call lamp lights till she has pressed down the last digit key of the number wanted. The rest of the work is done automatically and not her work. If the time for making the connection is taken by stop watch it is possible to obtain a very accurate picture of the ratio between rest period and working time for the individual operators. As the total number of connections made by each operator can also be registered by machines, it is possible to form an accurate picture of operating conditions. The influence of the subscribers on the time of traffic can also be studied without trouble.

In order to test the mechanical equipment of the exchange, a special switch is provided for whereby the supervisor can connect her switchboard with any operator's set and call for any number which the operator will then supply just as if an outside call were given. During this testing time the switchboard operator can receive no outside calls. The number which she returns to the supervisor by means of her desk sets appears in illuminated letters on a large switchboard panel visible to the entire room, and thus both operator and supervisor can tell at once whether the automatic set responds to the proper current impulses sent through. In this way it is possible to watch the operation of the exchange, both as to the mechanical and the human factor very closely.—*Telgr. u. Fernsprech. Tech.*

Telephone Business Under the Influence of the War.—The Lorenz Telephone Manufacturing Company in Berlin states that it is busy with orders for war material and that its usual telephone business is very poor. Business with neutral nations is also poor. About 200 men of the factory workers are serving with the colors. No dividend declared and no statement as to profit or loss.

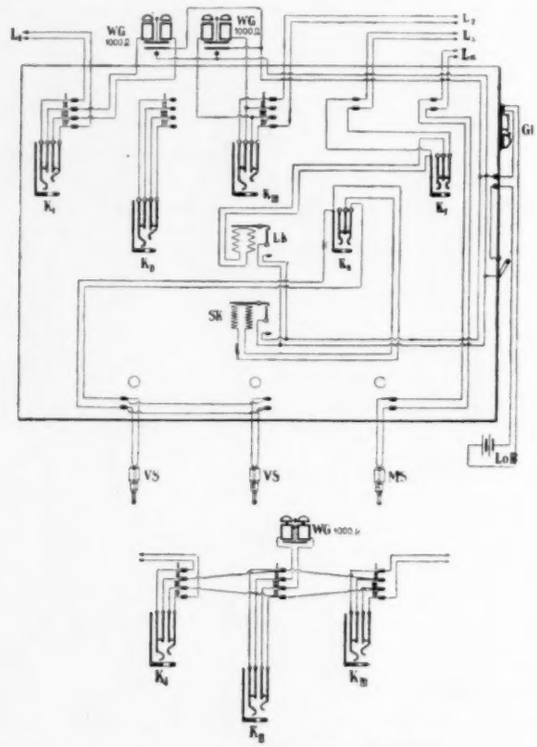


Fig. 8. Diagram for Wiring in Rural Exchanges.

K_1 K_{11} K_{111} = Keys for Telephone Lines.
K_1 = Key for Trunk Line Conversation, or to Exchange.
K_2 = Listening Key for Connecting Plug VS.
Ls = Line to Subscriber.
La = Line to Operator.
W.G. A. C. Telephone Call Bell.
GL. D. C. Telephone Call Bell.
L.K. Call, Drop Disc; SK = Supervisor Call Disc.
VS = Connecting Plug; MS = Inquiry Plug.
L_oB = Exchange Battery.

Deutsche Kabelwerke.—The German cable works in Berlin has now taken up the manufacture of cables with iron conductors instead of copper and has issued trade catalogues about these new cables. The company has also taken up the manufacture of all kinds of iron wire for telegraph and telephone work.

Norddeutsche Kabelwerke, Köln.—This cable work, which was organized four years ago and is a subsidiary of the Mix and Genet Company, was recently reorganized into a corporation with a capital of $400,000, of which the city of Cologne took $75,000. The works will expand its activity and take up the manufacture of rubber insulated wires. A new factor is being built in the city, to which will be transferred the workmen from the old factory.

Mix & Genet Company.—More details are now known about the business year of this company after making all depreciation reserves and reserve funds a net profit of $260,000 was voted for distribution among stockholders, equivalent to a 12 per cent dividend. The dividend will take about $125,000 for payment, leaving quite a balance for other reserve funds and payments. The last time such dividend was paid was in 1900. From that time on the company lost out through too extensive expansion, until in 1913 it was necessary to call in stock and to combine the old stock in the ratio 5:3 and pay out $250,000 to keep the company solvent. During 1913 and 1914 the company paid no dividends, turning all profits back into the company capital for improvements. The war brought out new problems which were solved by manufacturing war supplies, as stated in a previous issue.

Lorenz Telephone Works.—This company, with its offices in Berlin, states that its business year was favorable and that the turn-over surpassed that of 1913. The net earnings will not be used for funds and reserves, however, as $250,000 was assigned the previous year, and will be distributed as dividend. The previous year a dividend of 20 per cent and an extra dividend of 5 per cent were distributed.

A. T. & T. and Independents Study Long Distance

A representative of the Citizens Telephone Company, Grand Rapids, Mich., has returned from New York, where he went to attend a conference between a committee of the independent telephone interests and officers of the American Telegraph and Telephone Company regarding the opening of the American long distance lines to the independents. Many points already have been agreed upon, but up to this time there has been a sharp difference of opinion as to where the service should start from, whether at the point of the message's origin or at the junction points.

For instance, on a message from Cadillac to New York, the American Company has demanded that its toll shall begin at the point of origin, while the Citizens has insisted the message should come over its own lines to the junction point at Grand Rapids and the revenue prorated. This point was discussed at length and the officers of the American Company instead of giving a final answer took it under advisement. A joint committee representing the two interests will be appointed to study the situation in Ohio to ascertain exactly what the difference will be and the final decision will probably rest largely on this report.

Reuter's agency reports that recently the Russians entered a church, where they were courteously received by a venerable Psalm reader, and only accidentally discovered that there was a field telephone under the altar; the Psalm reader was a disguised Austrian officer.

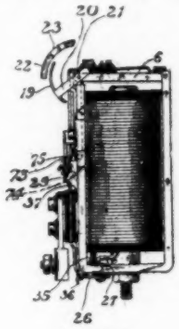
Telephone Patents Issued in June

A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

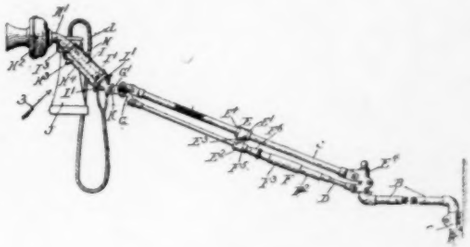
U. S. PATENT No. 1,141,107. Transmitter. Issued to W. W. Dean, assignor to Kellogg Switchboard & Supply Company, Chicago, Ill. (Application filed January 27, 1902.) An early application showing the box of the carbon cell carried upon the diaphragm and its post electrode attached to the transmitter bridge. The one claim is very specific to the mechanical construction.

1,141,119. Indicating Relay. Issued to William Kaisling, assignor to Kellogg Switchboard & Supply Company, Chicago, Ill. The relay comprises the usual parts of spool, magnetic frame, armature and contact points, and has the additional feature of novelty of a shutter, visible through a slot, by which a signal is displayed so long as the core of the relay is energized and its armature attracted. The shutter is pivoted upon the armature and has an angle of movement greater than the angle of movement of the armature.



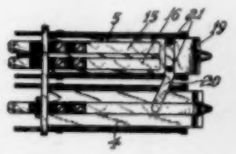
1,141,119.

1,141,279. Telephone Arm. Issued to Theodore Smith, assignor to Theodore Smith Manufacturing Company, Chicago, Ill. (Application filed August 14, 1905.) This patent shows a complete telephone set comprising transmitter, receiver, hook and an adjustable extension arm, all built into an integral device, attached by a bracket to the wall, and supporting the transmitter, etc., at any desired height or angle.



1,141,279.

1,141,352. Call Sender. Issued to F. R. McBerty, assignor to Western Electric Company, New York, N. Y. The system shown is suitable for the central office call sender, or keyboard call sender, in a semi-automatic telephone exchange. A series of counting relays are operated to count the number of controlling impulses sent for each figure transmitted, and a sequence switch or pilot switch is associated with the relays to restore them to normal for use several times in each operation of the sender, for the several figures of any telephone directory number.



1,141,982.

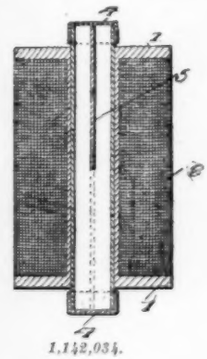
1,141,367. Call Counter. Issued to Victor Thompson, Vancouver, British Columbia, Canada. This call counter is a combination counter and coin collecting device. Where the price of a telephone connection is so low that a single coin will pay for two or more connections, the deposit of the proper coin will permit the use of the telephone, successively until the counting device has registered the number of calls for which the coin has paid, further calls then being rendered impossible until another coin has been deposited.

1,141,823. Signal System. Issued to Elisha Hamlin Osborn, Sauk Center, Minn. In connection with a ringing generator, switching devices running to the telephone lines may be operated to ring all of the bells upon all of the lines.

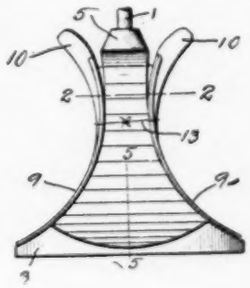
1,141,866. Pay-Station Signal. Issued to Gilbert Christian, assignor to the Wilcke-Armstrong Company, Detroit, Mich. In this pay-station, the sound of the signal gong is not produced by the coin hitting directly upon the gong, but instead the coin closes an electrical switch which causes an armature to tap the gong.

1,141,397. Extension Telephone System. Issued to E. R. Corwin, assignor to Frank B. Cook Company, Chicago, Ill. Where a telephone line serves a main answering station and a number of extension telephones, the extension telephones are arranged in an order and are connected to the line one by one until the desired station is reached, the control of connecting the extension stations resting with the answering station.

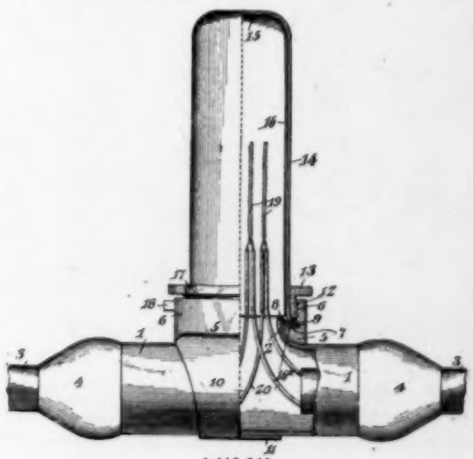
Kellogg Switchboard & Supply Company, Chicago, Ill. The features of the claim rest upon the method and mechanism for operating a pair of contact springs in the relay device. Two magnets are provided and two armatures. The first of the armatures controls the springs directly, but the other of the armatures has power to latch the springs in a changed relation until the first armature operates to unlatch them and restore them.



1,142,034.



1,142,347.



1,142,213.

1,142,034. Magnet Core. Issued to P. F. Gerding, Chicago, Ill. The magnet core is tubular, and is filled with a combination of strips and fine particles of magnetic material, the strips passing through the tube to the magnet heads which close the tubes,

and the fine magnetic particles being tightly packed about the strips. The core is quickly magnetized.

1,142,080. Telephone Switch. Issued to J. H. Clemons, Ilion, N. Y., assignor of parts to George Bates and F. B. Cady, Ilion, N. Y. A convenient construction of switch whereby a telephone may speak upon either of two lines, or may permit the two lines to be connected together and then speak upon them while thus connected.

1,142,213. Inspection Cable Splice. Issued to Herbert T. Whaler, Miami, Fla. This is a splice for lead cables, and comprises a lead sleeve to be wiped to the ends of the cables to be spliced, the sleeve having a side opening through which the conductors are brought to be joined together. The side opening has a brass screw collar, which is attached by a belt of brass passing around the body of the lead sleeve. The completed splice may be inspected, or the connections changed or tested, by unscrewing the top cap without disturbing the lead wiped joints.

1,142,228. Multiple Call Sender. Issued to Gotthilf A. Betulander, assignor to the Betulander Automatic Telephone Company, Ltd., London, England. Several impulse transmitters are arranged within a suitable case, and arranged with a single speed governor with tripping pawls in such manner that they will run down one after another. Each may be adjusted independently of the others, and the directory number of the desired telephone thus set up, after which the call will be sent with the several figures transmitted in their proper order.

1,142,347. Ground Anchor. Claude L. Matthews, assignor to W. N. Matthews and Brother, St. Louis, Mo. A ground anchor comprising a base with curved face surfaces, each of which surfaces has a vertical groove and slot, and each of which has a fluke arranged for sliding movement, each fluke being provided on its rear side with ribs which engage the slot and groove of the corresponding face of the base piece.

1,142,678. Automatic Telephone System. Issued to Gerald Deakin, Berkeley, Cal. In the repeating mechanism of an automatic telephone line having a repeater associated therewith, a shunt path is arranged through condensers for the speech circuit during conversation. The signaling circuit is maintained through the repeater mechanism until the connection with a called telephone is attained, and then the shunt path through the condensers is closed for conversation.

1,126,009. Signaling Device. Issued to R. N. Hill, Montclair, N. J., assignor to Western Electric Company, New York, N. Y. In a step-by-step selector, two series of impulses are sent, the second series being rendered ineffective except at a limited number of stations among which is the station to be selected.

1,126,046 and 1,026,048. Semi-Automatic System. Issued to F. R. McBerty, New Rochelle, N. Y., assignor to Western Electric Company, New York, N. Y. A call sender adjusted by the operator is latched into position to control the connector, the connector operating the key to return to normal and then to unlatch.

1,126,047. Automatic Switch System. Issued to F. R. McBerty, New Rochelle, N. Y., assignor to Western Electric Company, New York, N. Y. A system for preventing an automatic selecting switch from stopping between the stationary teeth, and for preventing the operating of a controlling call sender during such intervals.

1,126,120. Desk Stand. Issued to C. G. Stoll, Newark, N. J., assignor to Western Electric Company, New York, N. Y. The feature of novelty is that the plate mounting for the hook switch is combined with the transmitter lugs, the two removable jointly from the tubular column.

1,126,173. Call Sender. Issued to J. L. Wright, Cleveland, Ohio, assignor to the National Engineering Corporation, Washington, D. C. A toothed drum capable of sending one digit at one revolution is associated with four banks of keys and a set of relays such that by four revolutions it sends four digits from four depressed keys, in proper order.

New Rates in New York Cause 100 a Day Increase

Nearly 580,000 telephone subscribers of Greater New York on July 1 came into the enjoyment of the new telephone rates. There has been an increase of nearly 15,000 subscribers since the schedule was finally agreed on three months ago between the up-State Public Service Commission and the officials of the New York Telephone Company. Despite business conditions telephones are being put in throughout the city at the rate of about 100 a day.

Residents of Manhattan south of One Hundred and Tenth and One Hundred and Third streets—zone No. 1—have 314,612 telephones. Under the new rates they will be able to talk without extra charge, or with a charge of only 5 cents, to 576,000 stations. Residents of Upper Manhattan and the western section of the Bronx—which make up zone No. 2—have 105,903 telephones, and they will be able to talk to 554,000 stations. Zone No. 3, the eastern section of the Bronx, has 3,828 telephones, the subscribers for which will be able to talk to 545,000 others.

In zone No. 4, Central Brooklyn, there are 105,768 telephones, the new rates making their scope 576,000 stations. In zone No. 5, Southern Brooklyn, there are 10,147 telephones, their scope being 572,000 stations. In zone No. 6, Northern Queens, are 8,100 telephones, their scope being 570,000 stations. In zone No. 7, Eastern Queens, are 8,955 telephones, their scope being 565,000 stations. In zone No. 8, the Rockaway section, has 4,728 telephones, having a scope of 458,000 stations. In the zone comprising Northern Staten Island, 7,062 telephones, having a scope of 44,000 stations, and in Southern Staten Island are 525 telephones, their scope being 8,000 stations.

Another way in which the new rates affect the subscribers is that in zone No. 1 a charge of 5 cents or less per call will apply to zones in which are located 99.92 per cent of all the telephones within the city, leaving only .08 of 1 per cent in which the maximum charge of 10 cents will apply. Telephone service can be had, it is said, to the homes in which live considerably more than one-half the population of the city and to the places of employment of about four-fifths of those who work.

One of the questions that has been most frequently asked since the new rates were announced is whether calls made outside the local areas will be charged up against the number of calls to which the subscriber is entitled by his contract. The company's statement regarding this matter reads:

> A toll charge will be made for calls to telephones in zones beyond a local area. The rate will be 5 cents per call to all except the more remote zones, for which a charge of 10 cents will be made. Calls to the 5 and 10 cent zones, however, will not be counted against the number of local calls provided for in the subscriber's annual contract; the total charge, therefore, for such messages will be but 5 and 10 cents respectively.

Calls from public telephones have also been reduced. Calls between Lower Manhattan and Brooklyn will be 5 cents hereafter, instead of 10, and in no case will the charge be more than 10 cents.

Chicago Makes Appropriation for Investigation

Chicago aldermen have voted to retain Kempster B. Miller at a cost of $5,000 to report about September 1 on the possible uses to which the Chicago Tunnel Company's automatic plant may be put, the reasons for its failure until the present time, and similar questions that have been raised during the discussion.

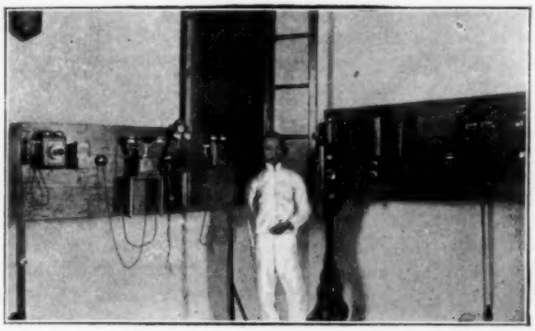
A heated discussion arose from the proposal that Mr. Miller's fee be paid by the tunnel company. That proposal finally was indorsed and the money will be placed in escrow, but it will not bet paid until the council reconvenes, if it be determined that the city should pay the money.

Of Interest to the Trade

What the Telephone and Accessory Manufacturers Are Doing to Advance the Art

The Telephone in China

Viewed in the light of occidental standards of progress, China is gradually, but none the less surely reaching the point that will entitle her to be classed as one of the essentially modern nations. With the enormous and practically unlimited industrial resources of the country and a population that is four times that of the United States, this end should be easily attainable, when aided by the awakening of the national spirit of the country.



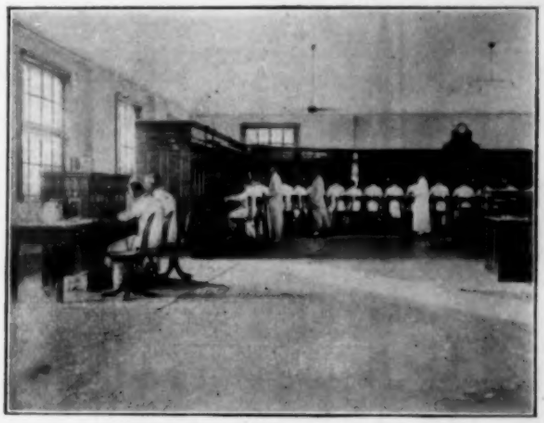
Model Telephone Circuits in Operators' School at Peking.

Twentieth century ideas and methods are being spread over China by those of her young men who, having been sent to European and American schools and universities to study modern arts and sciences, have returned to utilize this knowledge for the benefit of their own land. The Chinese are rapidly becoming modernized, one of the factors in the process being the increasing use of electricity and its offspring—the telephone.

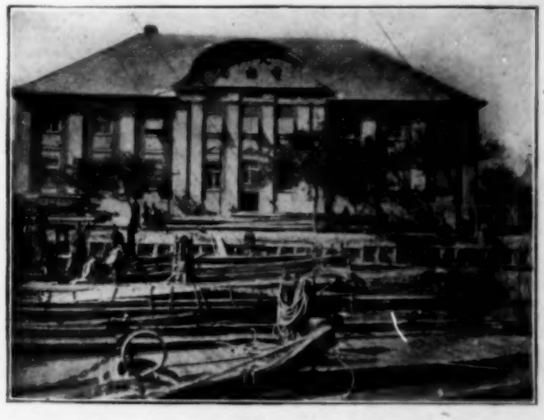
Interior, Telephone Central Office at Changsha.

Telephone development has, however, been hampered by the great amount of educational work needed to develop a well-defined demand for it. In certain portions of China there is another reason. A large portion of the population lives in boats or sampans that are from twenty to fifty feet long and line the river banks everywhere. Entire families live upon them and change their location from time to time. It is inconceivable to think of telephone service for the masses in such centers when it is said that in the city of Canton alone over 800,000 people live in twenty-foot homes. There is, however, an increasing demand for telephone service and the great progress is being made in that direction.

It is the intention of the Chinese central government, under the direction of the Ministry of Communications, to control and operate all telephone systems in China as they do the telegraphs, and the development is gradually being worked along this line. At the present time, however, there are many systems operated by local governments and private companies.



Interior, Tien Tsin Telephone Central Office.



Telephone Central Office Building, Tien Tsin.

Much of the telephone equipment that is in use in China—switchboards, telephone instruments and associated materials—has been "Made in the U. S. A." by the Western Electric Company and installed under the supervision of its experts.

The following are some of the most important equipments built by the Western Electric Company:

Peking—The system as originally installed in

Peking in 1911 consisted of two modern central battery exchanges, each with an equipment for 1,500 lines. During 1914 an addition to the system was completed, bringing the equipment up to 2,300 and 3,400 lines respectively, in the two exchanges, or a total equipment for 5,700 lines. In January, 1915, there were 4,100 subscriber stations connected. The Peking telephone system is controlled and operated by the Ministry of Communications.

Tientsin—During 1914, a modern central battery system was installed at Tientsin to replace the old magneto system. This consisted of one central exchange with an equipment for 4,000 lines. In January, 1915, there were 2,450 subscribers' stations connected. The Tientsin system is controlled and operated by the Ministry of Communications.

Changsha—A modern central battery system consisting of one central exchange with an equipment for 1,000 lines was installed in Changsha in 1914. In January, 1915, there were 600 subscriber stations in operation. This system is controlled and operated by the provincial government of the Province of Hunan.

Tsinanfu—In 1913 a modern magneto system, consisting of two central exchanges, was installed in Tsinanfu, with an equipment for 210 and 320 lines respectively. In January, 1915, there were 450 subscribers' stations connected. This system is controlled and operated by the provincial government of the Province of Shantung.

Extraordinary Long Distance Communication

A striking example of the value of the transcontinental telephone line was recently afforded in connection with the annual convention of the American Institute of Electrical Engineers at Deer Park, Md., says the *Journal of Electricity, Power and Gas*. Three papers to be read and discussed at the forenoon session on June 29, by Frederick Bedell and F. M. Mizushi were devoted to the subject of alternating current wave shapes, distortion factors, harmonics, etc. This subject, important in inductive interference between power and telephone lines, has been extensively studied by the Joint Committee on Inductive Interference appointed by the California State Railroad Commission. Its importance in this respect was not brought out in the papers to be presented. The Joint Committee felt that it should contribute to the discussion, but owing to late receipt of advance copies of the papers, and to the absence of several members from San Francisco, the matter could not be taken up actively until the morning of June 28. The American Telephone and Telegraph Company offered the use of its transcontinental line for the discussion of this subject if desired, and thereby made it possible for the Joint Committee to put its contribution directly before the convention, instead of in the form of a written contribution to the proceedings.

On the afternoon of June 28 the transcontinental telephone circuit was used by Messrs. J. E. Woodbridge and L. P. Ferris at San Francisco, talking with Messrs. H. S. Warren and H. S. Osborne at New York, to make arrangements for the transmission of the contribution. During the night of June 28 the Joint Committee's contribution of approximately three thousand words was forwarded by telegraph over the lines of the Pacific Telephone and Telegraph Company and the American Telephone and Telegraph Company through Pittsburgh to Deer Park, and the contribution was read at the session of the subsequent forenoon.

Owing to peculiar weather conditions at one point in the long line, telegraph transmission for a time was exceedingly difficult and threatened to become impossible. The eastern officials were ready with stenographers to take the message by telephone if necessary, but about midnight conditions changed for the better and the message was completed. This incident is a striking example of a practical use in a large way, of one of the engineering feats of this century.

Entertainment for Pan-American Delegates

A number of the South American delegates to the Pan-American financial conference recently held at Washington, together with the consuls at New York of the various South American countries, were entertained by the Western Electric Company at its New York office in the latter part of June.

The delegates, after being met by the company officials, were escorted through the engineering laboratories, where they were shown some experimental work. They were then taken to the exhibition room, where they had an opportunity to see and examine the various kinds of apparatus the company manufactures and sells. After partaking of an electrically cooked luncheon, the party talked on the transcontinental line with consuls at San Francisco, through the courtesy of the American Telephone and Telegraph Company. The guests were visibly impressed by their experience and expressed their amazement at the enormous progress which has been made in the telephone art.

Those in the party were: Dr. Garcia Leao, acting consul-general, and three delegates from Brazil; R. Sanches Crux, consul-general from Chile; L. Dolz, consul-general and Jose A. Torralbas, delegate from Cuba; Luis Gil, M. Gonzales, consul-general, and two delegates from Costa Rica; F. J. Peynado, delegate from Dominican Republic; R. Bengocchia, consul-general from Guatemala; J. C. Diaz, Haydee de Portocarrero, Albert Strauss, consul-general and two delegates from Nicaraugua; H. E. Bard, secretary of the Pan-American Society of the United States; one delegate from Panama; W. W. White, consul-general and son, from Paraguay; G. Arbizu, consul-general and two delegates, Dr. Alfonso Quinonez, vice-president, San Salvador, and Victor M. Escobar, allunoz from San Salvador; Mario L. Gil, consul-general from Uruguay; N. Veloz, vice-consul general and two delegates from Venezuela.

In the English House of Commons, Postmaster Herbert Samuel stated that about 36,000 of the postoffice staff were serving in the army and navy, and arrangements had been made to release many more. General facilities to enlist could not be given to telegraphists, linemen, and other skilled workmen on the engineering staff, because many thousands of those classes were required at home for military and naval work. Every effort would be made to provide employment for disabled soldiers and sailors, and no more boys would be taken on as telegraph messengers where disabled men could be employed; the latter would also be given first consideration for employment as night telephone operators.

A New Take Up Reel

A take-up reel that is a mighty convenient one for any operating company has been put on the market by the Oshkosh Manufacturing Company. The frame is of hardwood, well reinforced with strap steel and

In Collapsing It Throws Off the Coil.

cross-pieces, and folds up like a hinge when not in use. The reel part proper is made with malleable iron arms operating on a steel shaft and in collapsing automatically throws off the coil of wire. It is made for

The Reel Set Up.

12, 18, 21 and 24-inch coils, and easily pulls one-half mile of wire. In addition to its strength, compactness and light weight (weighing only 40 pounds), it can be

Folded Up.

sold considerably cheaper than take-up reels now on the market.

The illustrations denote the automatic, labor and time-saving features of the reel. The reels are carried by practically all jobbers and guaranteed by them as well as by the Oshkosh Manufacturing Company.

Up-To-Date Shopping

Newark, N. J., has a new shopping idea. Usually there are two ways of shopping—either by telephone or going personally into the store. This shopper goes to the window of the store, which, in this case, is the Western Electric Company's supply depot at No. 64 Park Place, picks up one of several Inter-phones extending through to the street side of the window, and talks to the clerk inside the window.

Experts in selling goods to the public often say that if a dealer can only get people inside his store, he will sell goods. That's why so many bargain days are conducted. People come for the bargains, but also buy other goods. Just to try out the psychology of this claim, the Western Electric Company's local manager, Benjamin Hurd, decided to find a way to sell goods and take orders without his customers coming inside at all. An increase in sales has resulted.

Here's the way Manager Hurd has worked out his new electrical seller: A desk equipped with order books, Inter-phones and electrical devices has been placed just inside the window. One of the office force, H. M. Burnett, sits at the desk, in plain view of the passing thousands. He is a very busy young man. His desk telephones are connected up to lines which reach to the outside. A customer comes along, sees some electrical appliance that he needs, picks up the outside Inter-phone, speaks quickly to the clerk in the window, who is there to take down orders, and asks the clerk for further details about cost, etc., of devices in the window. Usually a crowd stands about waiting for a chance to ask questions. Addresses are obtained and a mailing list improved by the arrangement, besides giving to the public an excellent idea of how an up-to-date concern handles its office work.

Standard Underground Gets Prize

The Standard Underground Cable Company, Pittsburgh, Pa., has been awarded a gold medal, or highest award in its class, by the International Jury of Award, Panama-Pacific International Exposition, for its exhibit of a complete line of electric wires, cables and cable accessories.

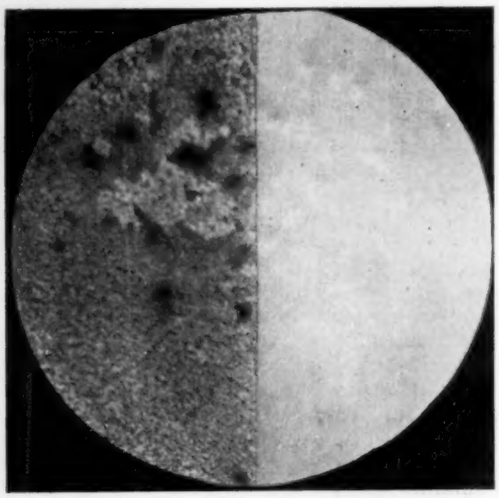
This is the seventh award of this degree which has been received by this company in as many different expositions, and as its products have never been in similar competition oftener, this constitutes a perfect score.

The exhibit consisted of samples of bare and insulated wire and cables of different kinds illustrating the great variety of these products manufactured by the Standard Company. Cable terminals, junction boxes and other cable accessories are also shown in considerable variety adapted to various classes of service. A unique and interesting feature of this company's exhibit is the use of copper ingots as posts and a large stranded bare copper cable as railing for enclosing its exhibit space. In order to introduce some movement into its exhibit two braiding machines are shown in operation weaving cotton insulating braid on a copper wire.

The Peninsular Telephone Company of Tampa, Florida, is planning to increase its telephone system by the addition of two Western Electric switchboard equipments. The plans call for switchboards arranged with the most modern devices for assuring a high grade of service. These devices include the flashing recall and automatic ringing and listening, incorporating the secret service feature. The switchboards will be of the central battery type.

Aseptifone, Germ Proof Mouthpiece

Dr. E. M. Jenkins, Italy, Texas, has invented and is placing on the market a new form of antiseptic or germicidal telephone mouthpiece, a sectional view of which is shown here. As will be seen, the device is so arranged that its outer case contains the antiseptic solution,



Left, Culture Taken From Regular Mouthpiece. Right, Culture Plate, Showing Sterility of Aseptifone.

which is replenished through the filler cap at the top. Through capillary action, the fluid is distributed through the moistening pad, which forms a part of the instrument. The perforations in the mouthpiece proper admit a sufficient amount of antiseptic moisture through evaporation to keep the inside and edges of the funnel in sterile condition.

Another photograph reproduced here shows cultures taken from both the regular mouthpiece and the

The Aseptifone.

Aseptifone. The left half of the cut shows a heavy culture prepared from an untreated mouthpiece. The right half shows failure to obtain a culture from the sterile surfaces of the Aseptifone mouthpiece, according to Drs. J. H. Black and J. Dougherty of the Southern Methodist University, Dallas, Tex., who have completed the experiments.

High Talk

The rush of the wind and the deafening roar of the propeller discourage conversation between the pilot and the passenger in an aeroplane. A special telephone equipment makes such conversation possible.

The apparatus, which is called an "Aero-phone," and has been developed by the Western Electric Company, manufacturer of the Bell telephone equipment, consists of two double-head telephone receivers and two special types of chest transmitters. The receivers are held against the ears by the spring head band so that practically all of the disturbing noises are excluded. The spring tension, however, is such that the entire outfit is not uncomfortable. The special transmitters are provided with soft rubber caps, and are strapped to the chest at a point below the collar-bone and above the third rib. In speaking, the chest muscles transmit the voice vibrations to the transmitter, thus enabling a telephone conversation to be carried on between the two occupants of the aeroplane.

The receivers and transmitters are connected by suitable cords, which terminate in a small plug. As the aviator or passenger takes his seat, the plug is inserted in a jack mounted in the framework of the aeroplane. One of these jacks is provided for each occupant. The battery required consists of three standard telephone dry batteries, which will provide continuous service for 100 hours without any appreciable loss of transmission quality.

The simplicity and efficiency of this apparatus is sure to find favor in aviation circles, especially in the military branch of aerial work, modern aerial warfare having made it necessary that aviator and passenger be in communication at all times. Undoubtedly, the Aero-phone will have a wide field of application.

Mutual Companies Within Compensation Act

That telephone companies, even though they are operated on a mutual basis, charging nothing for service to its subscribers, come within the provisions of the state compensation act, are liable for premiums to be paid into the state accident fund and are amenable under all the regulations of the industrial insurance law, is the opinion given to the Olympia, Wash., industrial insurance commission.

The question was raised in connection with two mutual telephone companies operating in Thurston county, one at Pleasant Glade and the other at Ward's Lake. These are not operated for profit, no charge being made for service. Ten subscribers form a unit in the plan, whenever ten more farmers signify their willingness to subscribe to the company another unit being added. One of the companies is incorporated and the other is not. One hires a lineman, while the other employs one of its own subscribers in this capacity, paying him a regular salary.

The industrial insurance commission had held, in ruling on this situation, that these companies, not being operated for profit and being nothing more than mutual organizations, were not amenable under the compensation act, but as a result of the attorney general's advice the companies must pay premiums into the accident fund.

The Holtzer-Cabot Electric Company makes "Reacts" electric horns for automobiles the subject of a very neat and interesting little booklet.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES.

At the forty-third commencement of the Stevens Institute of Technology, held at the institute in Hoboken recently, John J. Carty, chief engineer of the American Telephone & Telegraph Company, had the degree of Doctor of Engineering conferred upon him. Mr. Carty is also elected president of the American Institute of Electrical Engineers for the ensuing year.

D. F. Turnbull, commercial manager of the Bell Telephone & Telegraph Company at Atlanta, Georgia, has been promoted to the office of general manager of division six, at Louisville, Kentucky.

Edward Sorenson has been appointed local manager of the United Telephone Company's Taylor, Wisconsin, exchange and is now in charge of the local business.

J. W. Howatt of Minneapolis, was recently named supervisor of telephone lines in Minnesota by the state railway and warehouse commission.

Henry Diell was recently appointed manager of the exchange of the National Telephone & Electric Company at Weldon, Illinois, succeeding Mr. Gardner.

A. C. Boardman has accepted the appointment of district manager of the New York Telephone Company at Oswego, New York, succeeding H. F. Morgan, who has retired.

After twenty-eight years of service with the New England Telephone & Telegraph Company in Massachusetts, Cora E. Smith, was recently retired on a pension owing to ill-health.

Bernard C. Groh, formerly engineer for the Automatic Electric Company and now affiliated with the Tri-State Telephone and Telegraph Company of St. Paul, Minn., called at TELEPHONE ENGINEER offices last month.

C. C. Croke has been appointed district manager of the Roswell, Arizona, exchange of the Mountain States Telephone & Telegraph Company, succeeding George W. Thorp.

Robert G. Pate, formerly secretary of the Electrical League of Cleveland, Ohio, has been appointed commercial superintendent of the Cleveland Telephone Company, following the resignation of Thomas P. Cagwin, who has become secretary of the convention board of the Cleveland Chamber of Commerce.

A. S. Minor, who for several years has been manager of the Home Telephone Company at Owenton, Kentucky, has been transferred to Lawrenceburg, Kentucky, as manager of the exchange there.

Will Reed, owner of the telephone exchanges at Vivian and Amrichton, Louisiana, was drowned on July 6.

Mr. Page, manager of the Mountain States Telephone exchange at Fowler, Colorado, has been promoted to the position of manager at Rock Ford, Colorado, succeeding H. C. Braton.

C. W. Tucker has been appointed as Kansas City representative for the Kellogg Company. Mr. Tucker has secured splendid experience and training behind switchboards around arrester and terminal racks the switchboard of telephony as it were, and out on the right-of-way. This was experience that amounted to eight years' practical work. And besides, Mr. Tucker was fortified by his four-year course in mechanical and electrical engineering at Manhattan, Kansas, where he was graduated in 1912. Mr. Tucker became general superintendent of the De Soto Telephone Company, De Soto, Missouri, in 1913, remaining with them until July, 1915, at which time he entered the Kellogg Company's employ at Nebraska as state representative. Nebraska customers will find Mr. Tucker a tireless worker in aiding their best interests as well as in representing Kellogg equipment and the Kellogg watchword of service and efficiency. Mr. Tucker was born July 5, 1888.

R. E. MacCarty, formerly sales manager of the Lafayette Electric & Manufacturing Company of Lafayette, Ind., visited the offices of TELEPHONE ENGINEER last month. Mr. MacCarty is now connected with the A. F. Sheldon's of Chicago, efficiency experts, and is located with the Minneapolis branch.

NEWS FROM THE FIELD.

ALASKA.

The Juneau-Douglas telephone system at Valdez will be greatly improved, according to the announcement of Edward Webster. The line crossing Gastineau channel, now consisting of two wires, will be increased to four.

ALABAMA.

Extensive improvements are being made by the Southern Bell Telephone Company on their lines at Gadsden. New cables will be laid and a total of about $15,000 will be spent.

CALIFORNIA.

On July 1 the complete change of owners of the Sanger Telephone Company at Sanger was effected. Several new lines are being built, one that will connect Minkler and Tivy Valley with Sanger, also a line running out to the Hazleton ranch, on upper Kings river, that will connect with a mountain line owned by the cattlemen along Mill Creek, and also having a connection with the Forest Rangers line into the high Sierras.

Preparations are being made by the Telephone Pioneers of America for their fifth annual reunion to be held at San Francisco September 21, 22 and 23. Headquarters of the meeting will be at the St. Francis Hotel.

Telephone service in the Alta Vista tract has been assured in an appropriation of the telephone company, wihch was announced recently. The pole lines, aerial cables and wires will cost $1,600 and will be installed immediately. When completed the entire tract will be supplied with the service.

At a recent meeting of the stockholders of the Independent Telephone Company at Fowler the following directors were elected: C. Z. Peterson, J. F. Manley, J. H. Weinberg, J. M. Gillespie, George Elliott, P. V. Case and H. A. Harris.

The Pacific Telephone & Telegraph Company is arranging to establish an office in the Park street district, Alameda, as requested by the city council. The telephone company has promised to open the new office within the next few weeks.

The Pacific Telephone & Telegraph Company is preparing to place its wires underground in the business district of Long Beach at a cost of about $20,000.

Articles of incorporation have been filed at Riverside for the Colorado River Telephone Company with a capital stock of $25,000 by Floyd Brown, R. F. Hopkins, S. D. Kamrar.

CANADA.

The Kirkton, St. Marys & Medina Telephone Company has applied for a charter with capital $100,000.

The Prescott Rural Telephone Company, Ltd., Fournier, has obtained a charter.

CONNECTICUT.

Preparations are being made for an addition to the local building of the Southern New England Telephone Company on Fairfield avenue, Bridgeport. The addition will be the same height as the present structure and besides additional working room, provision will be made for general storage rooms.

The Southern New England Telephone Company has begun work on the construction of a telephone line between Rockville and Crystal Lake.

FLORIDA.

The Southern Bell Telephone & Telegraph Company of Palatka is to equip new and more comfortable quarters for its operatives and for this purpose will move as early as possible to the upper floor of the present building.

IDAHO.

Schupfer Brothers recently purchased from R. H. Porter the Potlatch telephone line at Juliatte. Many improvements are contemplated by the new owners.

ILLINOIS.

Eighteen thousand telephones in the Harrison office of the Chicago Telephone Company, which takes care of a large part of the loop's telephone traffic and which has occupied quarters on the seventh floor of the Manhattan building for several years, was cut over the Wabash exchange building at 520 Federal street, Chicago, on July 15.

Whiteside Farmers' Mutual Telephone Company, Prophetstown; name changed to Morrisson Telephone Company; capital increased from $20,000 to $50,000; extension of corporate existence.

The Kellogg Switchboard & Supply Company declared the regular quarterly dividend of 3 per cent, payable July 31 to stockholders of record July 29.

IOWA.

The Napier Telephone Company has been incorporated with a capital of $10,000. C. P. Ball, H. G. Shedd, and S. A. Walker are the incorporators.

The telephone exchange at Kingman is being rebuilt, making the plant first class in every respect. New poles will be set, new cables will be hung and a new switchboard will be installed.

KANSAS.

The new estimate being made of the local Missouri & Kansas Telephone exchange at Hutchinson, includes many new cables for telephones in the residence district. The cables formerly used will be cut in for the business district alone and new cables installed to care for the outlying residence telephones. The company will expend about $35,000 in improvements.

C. B. Harman recently sold the Valley Falls Independent Telephone Company to Walter Moxley and O. B. Clark of Nortonville for $8,000. The two men also bought the Bell mutual exchange at Valley Falls for $6,500, and will merge the two companies.

KENTUCKY.

Grassy & Blackwater Telephone Company, Nannie; capital $255. Incorporators: J. C. Murphy, M. N. Nickell, J. T. Lewis, A. W. Nickell, and A. P. Toliver.

The Grassy & Helechewa Telephone Company, Salem; Capital, $450. Incorporators: J. M. Amyz, S. R. Amyz, J. S. Amyz and W. P. Haulsey.

N. Starkey, general manager of the Eastern Kentucky Home Telephone Company, recently took over the controlling interest in Sandy Valley Telephone Company, consolidating under one management the two largest telephone corporations in eastern Kentucky.

MICHIGAN.

L. J. Walley and H. V. Weed of Detroit, traffic supervisors for the Michigan State Telephone Company, held a school of instruction at the Cushman house Petoskey, for long distance operators a short time ago.

C. E. Tarte, general manager of the Citizens Telephone Company at Grand Rapids announce approval by the state railroad commission to the advance in telephone rates for Lowell from $18 to $20 annually for business and $16 to $18 for residential purposes, the rates going into effect July 1.

The state railroad commission has approved the sale of the Michigan State Telephone Company's exchange to the Lenawee County Telephone Company. The consideration was $1,500.

At a meeting held recently in the Battle Creek Citizens Telephone Company, C. E. Tarte was re-elected president and A. E. Well, secretary.

MINNESOTA.

A new telephone system is being installed at Marshall.

At the annual meeting of the Kandiyohi County Telephone Company held recently at Willmar the following officers were elected for the enslning year: F. A. Nelson, president; P. J. Haley, vice-president; Nels Norell, secretary, and F. G. Handy, treasurer.

At a meeting of the directors of the Farmers Telephone Company, held at Maldred recently, the following officers were elected: D. L. Bowman, president; A. Brown, vice-president, and Albert Eastvold, secretary and treasurer.

The Mesaba Telephone Company recently completed the installing of a line between Virginia and Mountain Iron.

A franchise has been granted the Minnesota Telephone Company to operate in Brainerd.

The Murdock Central Telephone Exchange Company is being incorporated at Murdock. M. Welsh, John L. Yost, and J. N. Schoof are the incorporators.

At a business meeting of the Eastside Telephone Company, held at Opstead recently, the following officers were elected: President, E. E. Barhite; vice-president, N. B. Berg; secretary and treasurer, Algot Williams; directors, C. O. Swedberg, O. Westerberg, John Kalberg and Nels B. Berg.

Articles of incorporation have been filed for the Marine Home Telephone Company at Marine Mills, with a capital of $5,000. F. Emory Bell, Howard R. Bell and J. H. Bell are the incorporators.

MISSOURI.

The New Bell Telephone building at Hannibal, which has been in the course of construction for some time, has been completed and is one of the most complete plants in the state.

A new telephone system in Fulton was ordered by the State Public Service Commission at Jefferson City, recently. The order of the commission permits General M. F. Bell and his associates to purchase the old telephone plants now in operation in Fulton, and consolidate them within thirty days, and requires the new company to build a modern, up-to-date plant within nine months.

L. F. Coulter recently sold his stock in the telephone business at Booneville to W. W. Kingsbury.

P. Kerr Higgins, general manager for the Clay County Telephone Company, has closed a contract for the installation of a new, complete long distance switchboard outfit for Liberty.

The Weaubleau Telephone Exchange at Weaubleau was sold at public auction on July 2, to C. R. Hardy, assistant cashier of the bank of Weaubleau, for a consideration of $700. The sale was made following the closing of a mortgage.

The telephone exchange at Morrisville, owned by Bert McDonald, has been traded to J. T. Fender of Pleasant Hope, for 160 acres of land fourteen miles north of Springfield. The sale price of the exchange was given as $3,200 and the value of the farm was placed at $5,000.

Officers of the Madison and Kansas Telephone Company recently sent to the M. Lemmon, city comptroller, a check for $3,252.14, the company's franchise tax for the six months ending July 1. A statement accompanying the check advised that the company's gross earnings for the half-year period had been $161,607.24. The tax is 2 per cent of this amount.

MISSISSIPPI.

A contract has been awarded for the construction of Vicksburg's new telephone exchange. The building will cost $40,000.

MONTANA.

The Wilsall Telephone Company is rebuilding its telephone lines north of Butte. The system was almost destroyed by a recent windstorm.

The Bell Telephone Company at Bozeman, has taken over the automatic telephone system, leaving but one system in Bozeman.

The Forest service people are building a telephone line from Leacock station to Forney.

NEW YORK.

The Barranquilla Telephone Company, New York. The business of a telephone, telegraph and electric light company. Capital, $150,000.

The West New Brighton commercial office of the telephone company moved into its new quarters in the Sharrett building, Port Richmond, on July 1.

New York city's new telephone rate schedules, which provide more service at less cost for message rate subscribers, became effective July 1. The new schedules are the result of an agreement reached by the public service commission and the telephone company, and are in accordance with the formal order of the commission dated March 30, last.

The local commercial office of the New York Telephone Company has removed to its new quarters on the first floor of the new telephone building at Albany. The offices are very attractively equipped and conveniently arranged.

NORTH DAKOTA.

The Stanley Short Line Telephone Company at Stanley, has been incorporated with a capital of $18,000. H. P. Duggan, William O. Nelson, and Andrew Johnson are the incorporators.

At the annual meeting of the directors of the Ellendale-Fullerton Telephone Company held at Fullerton recently, the following officers were elected: E. J. M. Wippich, president, and E. J. Williams, secretary and treasurer.

Brisbane-Lark Farmers' Telephone Company, Lark, Morton county; capital stock, $3,000. Incorporators: W. T. Roberts, F. A. Wagner, both of Lark, and A. L. Drew, Raleigh.

At the annual meeting of the Renville Telephone Company, held recently at Donnybrook, the following officers were elected for the coming year: president, Amil Gludt; vice-president, Jas. Olson; secretary and treasurer, Geo. Michel.

The long distance telephone department of the Saskatchewan government will build a line into Sherwood in the near future. The line will connect with Edmore.

The Van Hook Farmers Telephone Company is being incorporated at Van Hook with a capital of $10,000. P. L. Lindley, John Haley and M. B. Tollefson are the incorporators.

Work will be started very shortly on the construction of the Farmers Mutual Telephone Company's line at Fargo.

Plans are under way for the installation of new telephone lines south of Bingford.

Work has been started on the construction of the Farmers Mutual Telephone Company's line at Stanton.

The Wing Mutual Telephone Company has been organized at Wing with a capital of $10,000 by N. M. Christenson, B. E. Eid and W. H. Gambs.

A meeting of the stockholders of the telephone company

at Dazey was held on June 11 for the purpose of considering the transferring of the head offices of the company to Hannaford.

Articles of incorporation were issued May 25 to the Kuhn Telephone Company of Richardton. The capital stock of the company is $10,000. It expects to build about twenty-five miles of line during the summer.

OHIO.

The local branch of the Ohio State Telephone Company at Massillon, will commence the work of placing its wires and cables in underground conduits through a section comprising the central portion of the city, immediately.

Nearly two hundred managers, chief operators and operators from the states of Ohio, Michigan and Indiana attended the conference held at the Benobia theater, Toledo, on July 6 and 7, under the auspices of the Ohio State Telephone Company.

The new exchange of the Bell Telephone Company in Struthers was put in operation recently, and is now a unit of the Youngstown system.

The executive committee of the Ohio State Telephone Company has just approved estimates for improvements to the extent of $119,000, including $80,000 to be spent in Columbus for additional cable equipment and a new sub-exchange in the Clintonville district in North Columbus. The exact location of the new automatic sub-exchange has not yet been decided.

West Jefferson Home Telephone Company, West Jefferson; $10,000 to $45,000.

Between $500 and $1,000 loss was sustained by the Eaton Telephone Company when fire destroyed its storage house and contents on South Cherry street recently.

The Ohio State Telephone Company has been granted a permit to build a new exchange on East Rayen avenue, Youngstown, to cost $20,000. The structure will be of brick.

OKLAHOMA.

W. E. Baker has sold the telephone exchange at Ripley to George G. Youngblood, who took possession June 1.

A force of men is now at work on a new toll line of the telephone company between Harper and Alva.

Plainview Telephone Company, Lookeba; capital stock $300. J. W. Sheffer, Lookeba; Charles Zobisch, Hinton; J. S. Murphy, Lookeba.

OREGON.

Articles of incorporation have been filed by the Riverside Telephone Company at Salem; capitalization, $750, and the incorporators are: Orville Butler, Donald P. MacCarthy and John F. Groves, all of Marion county.

H. C. Kauffman recently purchased a controlling interest in the Willapa Harbor Telephone Company at South Bend.

W. F. King, director of the Pioneer Telephone Company, operating in central Oregon, has announced that it will construct a double metallic telephone line from Madras to Culver by way of Metolius.

The county court has issued an order granting a franchise to the Medical Springs Telephone Company to operate from the boundary of Baker to Medical Springs and Keating.

The Pioneer Telephone Company of Madras, which operates in central Oregon, has announced that construction of a double metallic line from Madras to Culver via Metolius will soon be undertaken.

Work has been begun on twelve miles of government forest service trail and telephone line from Cascadia on the South Santiam River, forty-five miles southeast of Albany, over the divide to Quartzville.

Supervisor Sietz of the Crater Lake National Forest states that local telephone exchange will be established in Oakridge in the near future. A switchboard is to be installed and government lines extending out of Oakridge and now operated as one system will be separated into three systems.

PENNSYLVANIA.

Youngsville Telephone Company, Youngsville, Warren county, and vicinity, capital, $5,000; incorporators: D. W. Mead, E. L. Coover, R. H. McDonald, H. H. Hull and A. E. Cole, Youngsville.

The United Telephone Company is rebuilding all its lines in the vicinity of Shamokin, and recently installed a new switch board in the local exchange, giving Shamokin the common battery system and now is to provide good connections with Kulpmont.

Stockholders of the Mutual Telephone Company at Erie, have decided to increase the authorized capital stock of the company from $500,000 to $1,000,000. The directors of the Mutual Telephone Company are William B. Trask, Dr. George B. Kalb, William Spencer, Thomas G. Morse and W. E. Hayes.

The Bell Telephone Company is making extensive improvements on their system at Saegertown.

The Mt. Gretna exchange of the Bell Telephone Company has been opened for service during the summer months and over forty telephones have been connected on the switchboard for summer service.

SOUTH DAKOTA.

At a meeting of the directors of the Gary Telephone Company held recently at Gary, the following officers were elected: L. C. Solberg, president; William Banwarth, vice-president, and E. Allisson, secretary.

A petition was recently filed by the Pioneer Rural Telephone Company at Hitchcock for the dissolution of said corporation.

The Custer County Telephone Company, Custer, capital, $25,000. Incorporators: Frank N. Sutherland, Peter Ziemeet, Arthur Montgomery.

Efforts are being made to consolidate the various rural telephone lines which have their terminus in Letcher. The local system will enter into the consolidation when it is perfected. It is believed the consolidation will prove of benefit to all the patrons of the various lines.

Bison Telephone Company, with a capital of $25,000. Incorporators: Fred Jenewine, Oscar A. Loose, Albert McKinstry, Sam Hooker, Charles S. Reed.

Articles of incorporation have been filed for the White Swan Telephone Company at White Swan, with a capital of $900. Incorporators: Frank Dvorak, Joseph Svanda, Aloiz Bausa.

Articles of incorporation have been filed for the Yellow Medicine Telephone Company at Vivian, with a capital of $1,000. The incorporators are: A. N. Whittaker, G. J. Lintvedt, Ole K. Sletto.

At a meeting of the promoters of the Breckenridge telephone line held recently it was decided to incorporate the company under the name of the Bison Telephone Company, with headquarters at Bison, and then to secure a franchise from the county commissioners of Perkins county for the construction of lines all over this section of the county. The equipment of phones, wire and poles for twenty miles of line has already been placed and the construction work will be pushed. It is expected the line will be completed about July 1.

TENNESSEE.

An enthusiastic meeting of several hundred home and independent telephone executives, representing the various home and independent telephone companies throughout Tennessee, the southern part of Kentucky and the northern part of Mississippi, was held at the South county court house at Carthage on July 3.

Work will be started within the near future on improving the Cumberland Telephone & Telegraph Company's Rockwood plant.

Oakland Telephone Company, Oakland, Fayette county, capital stock, $1,000. Incorporators: T. M. Ross, Julian Thord, A. A. Smith, P. D. Henry, E. P. Hopper. To construct and operate a telephone line from Oakland to other points in Fayette county, Tennessee.

TEXAS.

The Grayson County Telephone Company is stringing three additional lines between Denison and Sherman.

The uniting of the Orange Home Telephone Company exchange with the Southwestern Telegraph & Telephone Company at Waco, was proposed by officers E. C. Blomeyer and H. E. Keppler of the latter company at Orange recently.

Minor repairs amounting to several thousand dollars are to be made in the near future on the Southwestern Telephone & Telegraph Company's building at Galveston. The outside walls are to be painted and the offices on the first floor refitted. A tile floor is to be substituted for the old wooden floor in the office. It is expected that plans for permanent improvement will be adopted within a very short time.

A proposal has been submitted to the city commission at Austin for the merging of the Southwestern Telephone & Telegraph Company and the United or Independent Telephone Company. Should the city commissioners agree to the proposition, the company agrees to erect a modern fireproof building to cost approximately $100,000.

The attempt to consolidate the two local telephone exchanges in Temple, has been abandoned.

The new telephone company's office at Ozona is now under construction. This is a home company, capitalized at $20,000, and is expected to extend the line to Sonora, Bonhart, Eldorado, Sheffield and all surrounding ranches. This will make two telephone systems for Ozona.

C. A. Stuart of Texarkana has become owner of the ex-

change, lines and other property of the Home Telephone Company at Greenville. The deal was made recently, the consideration being $100,000. Judge S. A. Lindsley of Tyler, president of the company, retires and Mr. Stuart succeeds him. J. H. Beall of Greenville will be secretary-treasurer.

Arrangements have been perfected between the board of city commissioners and the management of the United Telephone Company and the Southwestern Telephone Company for the merging or consolidation of the two companies' business in Taylor, so that in future only one company will handle all telephone business in Taylor.

Ozona Telephone Company of Ozona, Crockett county; capital stock $15,000. Incorporators: H. W. B. Montgomery, L. B. Cox and P. L. Childress.

Cleburne will have an addition of 500 lines to its telephone system in the near future.

The Southwestern Telephone Company has begun extensive improvements in preparation for the new building which is to be erected at the corner of Liberty and Main streets, Beaumont. The company is adding equipment in the way of additional switchboard room, wires and cables to take care of a large number of additional telephones.

UTAH.

The citizens of American Fork have applied for a telephone franchise. It is expected same will be granted within the very near future.

VIRGINIA.

Locust Grove Mutual Telephone Company, Locust Grove. Maximum, $5,000; minimum, $500; par value, $5 per share. W. J. Kropff, president, Copper Hill; G. W. Martin, secretary and treasurer, Terrys Fork.

The Southern Mutual Telephone Company of Franklin, Bedford and Pittsylvania counties, Progress. Maximum, $5,000; minimum, $1,000; par value, $25. Dr. G. O. Giles, president, Pen Hook; Dr. S. A. Reynolds, vice-president, Vashti; H. G. Motley, secretary, Sontag. Purposes: to build a new telephone line.

Wine Telephone Company, Incorporated, Wheatfield; capital, maximum, $3,000; minimum, $300; par $25; to build and operate a telephone line fifty miles long. Elmer Godlove, president, Lebanon Church; F. M. Smith, vice-president, Lebanon Church; W. B. Little, secretary and treasurer, Wheatfield.

WASHINGTON.

G. F. Green, owner of the local telephone system at Brewster, recently purchased the telephone system at Bridgeport.

The local telephone system at Brewster, owned by G. F. Green, is extending its line to Harmony Heights.

H. P. Thayer recently purchased the telephone exchange at Marcus and work has been started on placing the system in first-class shape.

Representatives of twenty-five telephone companies at a meeting held recently in Seattle formed the Independent Telephone Association of Washington, and elected J. M. Winslow of Seattle and Everett, president. Other officers chosen were vice-president, C. J. Farmer of Port Angeles; treasurer, John King of Puyallup; secretary, H. J. Roake of Tacoma; directors: Mrs. K. Glover of Concrete, H. C. Coffman of Chehalis, A. T. West of Spokane, R. W. McGillan of Pullman, and A. R. Warren of Tacoma. The association was formed for the purpose of permitting the telephone companies to meet all problems of the industry with co-operative effort.

President Frank T. Post of the Home Telephone Company has announced that all details connected with the transfer of the property of the Pacific Telephone Company to the Home Company has been completed. The headquarters of the Home Company will be transferred to the Pacific building on Second avenue from the former Home office on Howard street. Patrons of the Home Company now served with automatic telephones will gradually be taken over and given the manual service, and the last of the automatic phone in Spokane is expected to be seen within a very short time.

WEST VIRGINIA.

The National Telephone Company of Wheeling recently opened new offices in the Board of Trade building.

The Uniontown, Pennsylvania, district of the Bell Telephone Company, has been merged into the Wheeling district, to be under the supervision of Manager H. G. Bills of Wheeling, and to be known as the Wheeling district.

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